# USER MANUAL FOR MOVING SIGN

## Series E2000

**LED ELECTRONIC DISPLAY** Revision: **1.1**

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# User manual of Multi-Line LED Electronic Message Center

## Outline

Our Multi-line Electronic Message Centers(E200 Moving sign) offer an added level of flexibility to your information display system. They are excellent for detail and multi-tasking requirements. More specialized functions allow you to develop eye-catching messages that attract more customers and promote their organizations more effectively.

They are easy to operate and install, can stand-alone as a single electronic display or network as an enterprise wide system of message centers. Based on a modular construction, they allow for a variety of lengths.

They can apply to Corporate Communication, Event Listing, Retail Businesses, Medical Offices, Advertising, Waiting areas, Financial Information, Safety Awareness, Announcements and so on. And it brought more convenient for our life.

## Features

**We use the latest achievements in LED Electronic Message Centers.**

- Display English or European characters as well as graphic symbols.
- 41 methods of displaying your message (Cyclic, Scroll up, Scroll down, Open to Center, Open from Right, Open from left, etc.)
- 9 Fonts, each with regular, bold and wide mode. User can add or modify the fonts. 67 pieces of other European characters
- Built-in timer to power on/off during the day
- Built-in real time clock. 4 kinds of time and 5 kinds of date formats. Customized time/date format are also available
- With memory capability of 16k bytes for text, 24k bytes for graphics, max. 250 text files and 250 graphic files.
- 8 programmable display speeds
- 8 pause periods from 0 to 60 seconds
- 3 different buzz sound can be added anywhere within the message.
- Count-down/count-up function
- Segmented display capability to allow separate control of sections of the display


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- Sequencing multiple messages. Built-in scheduler for up to 30 tasks. 3 priority setting enables scheduling by week, month or year.
- Duplex function allows user read data from one sign by a PC and copy it to another sign
- Up to 128 units can network via RS422 communication
- Interface of the managing software can be in multiple languages
- Password protection.
- Low consumption
- Fixing methods: desk, wall or ceiling
- Display Real Temperature (optional)
- TCP/IP network control (optional)


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## ■ *Thank you very much that you purchase our product*

After opens the packing box, please first inspects the fitting according to the detailed list of supply items. If there are something has damaged or lack, please contact your dealer as soon as possible!


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# Catalog

**Foreword** ····· **8**

**0. Safety** ····· **9**

A: Safety guide ····· 9

B: Important Safety Precaution ····· 10

C: Important Warning ····· 11

**1. Introduction** ····· **12**

**1.1 System Outline** ····· 12

**1.2 Technical Specification** ····· 14

**1.3 Function Information** ····· 15

1.3.1 Power-on Initialization ····· 15

1.3.2 Sign ON/OFF Switching ····· 15

1.3.3 Setting Default File ····· 16

1.3.4 Display Text ····· 16

1.3.5 Main Menu ····· 16

**2. Function & Operation** ····· **18**

**2.1 Text Program** ····· 18

2.1.1 Creating New Text Files ····· 18

2.1.2 Text File Commands ····· 18

2.1.3 Edit Text Files ····· 19

2.1.3.1 Text Editor Interface ····· 19

2.1.3.2 Text Editor Command Keys ····· 20

2.1.3.3 Changing Character Font ····· 20

2.1.3.4 Changing Display Method ····· 21

2.1.3.5 Using Bold Wide and Blink Font ····· 21

2.1.3.6 Changing Character Color ····· 21

2.1.3.7 Changing Message Moving Speed ····· 22

2.1.3.8 Changing Message Pause Period ····· 22

2.1.3.9 Displaying Time and Date ····· 23

2.1.3.10 Displaying Graphics ····· 23

2.1.3.11 Starting New Line ····· 23

2.1.3.12 Starting New Page ····· 23

2.1.3.13 Multi-Window Function ····· 24

2.1.3.14 Including Existing Text Files ····· 24

2.1.3.15 Changing Line Spacing ····· 25

2.1.3.16 Fast Cursor Positioning ····· 25

2.1.3.17 Deleting Large Number of Characters ····· 25

2.1.3.18 Sound with Text ····· 26

2.1.3.19 Inserting International Character ····· 26

2.1.3.20 Displaying Temperature ····· 26


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2.1.3.21 Create a Decounter or Incounter ····26
**2.2 Graphics Program** ····27
2.2.1 Creating New Graphics Files ····27
2.2.2 Graphics File Commands ····27
2.2.3 Edit Graphics File ····28
2.2.3.1 Graphics Editor Command Keys ····28
2.2.3.2 Changing Graphics Size ····29
2.2.3.3 Draw and Erase ····29
2.2.3.4 Clearing Entire Graphics File ····29
**2.3 Program Schedule** ····30
2.3.1 Adding New Task To Schedule ····30
2.3.2 Modifying Existing Schedule Task ····32
2.3.3 Deleting Task From Schedule ····32
2.3.4 Enabling/Disabling Schedule Task ····32
**2.4 System Setup** ····32
2.4.1 Date & Time ····32
2.4.2 Serial ID Address ····32
2.4.3 Baud Rate ····32
2.4.4 Password ····32
2.4.5 Auto Power ON/OFF ····32
2.4.6 Sound ON/OF ····32
2.4.7 Backup ON/OF ····32
2.4.8 Recover ON/OF ····32
2.4.9 Battery ON/OF ····32
2.4.10 Auto Demo ON/OF ····32
2.4.11 Make Startup ····32
2.4.12 Clear Startup ····32
**2.5 Other Functions** ····32
2.5.1 Clear Memory ····32
2.5.2 Clear Schedule ····32
2.5.3 Clear Graphics Files ····32
2.5.4 Clear Text Files ····32
2.5.5 View Memory Information ····32
2.5.6 Send Memory ····32
2.5.7 Backup Memory ····32
2.5.8 Recover Memory ····32
**3. Installation ····32**
**3.1 Overview** ····32
**3.2 Common mounting method** ····32
**4. System Connection ····32**
**4.1 Data Interface** ····32
**4.2 Power connection** ····32
**4.3 Communication connection** ····32


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4.3.1 RS232 Communication ····· 32
4.3.2 RS422 communication ····· 32
4.3.3 Modem communication ····· 32
4.3.4 RF modem communication ····· 32
4.3.5 GSM modem communication ····· 32
4.3.6 Optical modem communication ····· 32
4.3.7 USB communication ····· 32
4.3.8 TCP/IP network(LAN) communication ····· 32

**5. Installing Programs PC Setting ····· 32**
**5.1 Installing the Management software** ····· 32
**5.2 Setting your Software** ····· 32

**6. Maintenance & Troubleshooting ····· 32**
**6.1 Maintenance** ····· 32
**6.2 Cleaning moving sign** ····· 32
**6.3 Replacement** ····· 32
**6.4 Troubleshooting** ····· 32
**6.5 Return and Repair** ····· 32

**7. Appendix ····· 32**
***Appendix A: Additional programming tips*** ····· 32
***Appendix B: Listing of color*** ····· 32
***Appendix C: Listing of symbol characters*** ····· 32
***Appendix D: International characters*** ····· 32
***Appendix E: Remote keys description*** ····· 32
***Appendix F: File Log*** ····· 32

**8. Statement ····· 32**


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# Foreword

The foreword partial has mainly outlined the User Manual of Multi-Line LED Electronic Message Centers. Mainly includes:

- About this Manual
- Information feedback

## About This Manual

This Manual is about Multi-Line LED Electronic Message Centers(we often called it as Multi-Line Moving Sign or E2000). It explains the operation, system connection, installation, maintenance and troubleshooting of the display.

## Reader of the Manual

This manual is for the user and the Maintenance of equipment personnel as well as who needs to purchase our product to write. Hope it will bring some help for you!

## Contents of the manual

This manual includes seven parts: Introduction, Function & Operation, Installation, System Connection, Installing programs PC setting, Maintenance and Troubleshooting, Appendix, Statement.

- Introduction: Description the basic information needed to use the system of Multi-Line Moving Sign.
- Function & Operation: Description of the function and operation. User must red it before operation.
- Installation: Gives guidance on installing for moving sign.
- System Connection: Gives guidance on power cable connection and communication connection for whole system.
- Installing programs PC setting: Describes installing the program on PC and setting of software.
- Maintenance & Troubleshooting: Introduce such things as troubleshooting the sign, performing general maintenance.
- Appendix: List additional thing about this system.
- Statement: States the copyright.


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# 0. Safety

## A: Safety guide

**Personal protection**

☺ Ensure you understand and follow all the safety guidelines, safety instructions, warnings and notes mentioned in this manual.
☺ Wear a hard hat to reduce the risk of personal injury.
☺ Be careful while working with heavy loads.
☺ Mind your fingers while working with heavy loads.

**Installation personnel**

The installation must be performed by authorized and qualified technical personnel only.
Accredited safety officers must ensure the safety of the site, construction, assembly, connection, use, dismantling, transport etc. of such safety critical systems.

**Notes**

Installation should be performed only after you are thoroughly familiar with all of the proper safety checks and installation instructions.
Do not modify and/or replace any component. We uses specific materials and manufacturing processes in order to achieve part strength. Consult us for assistance with custom applications.
Always follow our installation manual. Contact us if you should have any question regarding the safety of an application.

**Product care**

Structural and mounting components should be kept dry, clean and otherwise maintained in a manner consistent with part design. Our products must be used in a manner consistent with their design and inspected on a routine basis for security, wear, deformation, corrosion and any other circumstances that may affect the load handling capability of the part.
This product should be operated from the type of power source indicated on the marking label. If you are not sure of power available, consult your dealer or local power company.


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We recommends inspections at regular intervals for all installations and increasing in frequency for more critical installations. If a part is found to have damage, which may cause a decrease in load capability, the part must be removed for service or replaced immediately.

## B: Important Safety Precaution

- Read and understand these instructions.
- Heed all warnings.
- Follow all instructions.
- Personnel must be professional to installing and maintenance.
- Unplug this product from the electrical outlet before cleaning. Clean only with materials or chemicals that are inert, nonabrasive, noncorrosive and non-marking. Consult the manufacturer for further advice should any doubts exist regarding any cleaning procedure.
- Do not block ventilation openings.
- Avoid locations that are subject to direct sunlight (except outdoor models), excessive heat, moisture and dust such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Don't defeat the safety purpose of the polarized or grounding type plugs/sockets. If the provided sockets/plugs are damaged then replacement of the defective parts must be undertaken immediately.
- Protect the power/data cables from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Replace damaged power/data cables immediately.
- Only use accessories specified by the manufacturer.
- Disconnect the power to this apparatus during lightning storms or provide suitable additional lightning protection. Unplug this apparatus when unused for long period of time.
- Refer all servicing to qualified service technicians/personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cable or plug is damaged, the apparatus does not working normally, or has been dropped.
- Use only with systems or peripherals specified by the manufacturer. Use caution during lifting/moving or transporting to avoid damage by possible tipping.
- Please check truss installation when you mounting the moving sign.
- Must know the weight for this system before mounting.


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# C: Important Warning

**Important warning:**

1. **Danger of electric shock**

   Don't open or touch! To reduce the danger of electric shock, don't remove cover.

   The lightning flash with an arrowhead is intended to tell the user that parts inside the product may cause a danger of electrical shock to persons.

2. **Danger of fire**

   To protect against danger of fire by overloading of power cables. Power cable may be connected in parallel. Each power source cable supplying for moving sign should be protected by a circuit breaker or fuses rated.

3. **Working environment**

   Temperature: -10□ to +40□(Indoor product ); -20□ to +60□(Outdoor product ).

   Humidity: 15%~95% RH.

4. **Electro-Static protect**

   LED components used in moving sign are Electro-Static discharge sensitive. To prevent the possibility of destroying LED components do not touch either in operation or while switched off. Servicing or maintaining must be with anti-static instrument(such as ESD hand/heel straps).

5. **The equipment must be earthed**

   In order to protect against danger of electric shock, the installation should be properly grounded. We recommend a resistance to ground less than 10 ohms.

6. **Power cables**

   The power cables delivered with this system have special properties for safety. They are not user serviceable. If the power cables are damaged, replace only with new ones. Never try to repair a power cable.

7. **Data cables**

   The data cables provided with this system have special properties for safety. They are not user serviceable. If the data cables are damaged, replace only with new ones. Never try to repair a data cable.

8. Keep flammable materials away from the equipment (such as curtains). A lot of heat emanated from sign while working. Proper ventilation must be provided.


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# 1. Introduction

This part has introduced some elementary knowledge and the technical specification of the system. It including following content:

- System outline
- Technical specification
- Function information

## 1.1 System Outline

This system is a Multi-Line LED Electronic Center. It is capable of displaying text and graphics. Messages are stored as files. The system has 16,384 bytes of memory for text files and 24,576 bytes for graphics files. Maximum number of stored text and graphics files is 250 each. Maximum size of a file can reach the entire memory size of the system.

Following is something about the system:

- 16 color combinations:
  - 3 basic colors
  - 5 rainbow colors
  - 8 mixture colors
  - Automatic color rotation (ACL)
- 9 fonts: SS5, SS7, SF7, SF10, SS16, SF16, TM16, AR16, SMA. Plus all fonts may be BOLD and/or WIDE.
- 41 display modes:
  - 6 slide modes
  - 6 cover modes
  - 6 roll modes
  - 4 interlace-slide modes
  - 6 interlace-roll modes
  - 4 shutter modes
  - 9 special effect modes

  **AUTO** display randomly selects one of available display modes

  **SCROLL** display mode for **scrolling** of large continuous messages

  **ROTATE** display mode for **rotating** of a continuous message
- 8 message moving speeds
- 8 pause periods from 0 to 60 seconds
- 3 kinds of audible beeps during text display


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- 61 special international characters.
- 4 time and 5 date formats. Custom time/date format also available.
- 8-characters length file name. Maximum 250 text files and maximum 250 graphic files.
- Text Memory: 16k bytes
- 24k bytes graphics memory for 38 colorful graphics (or more) at 160*16 pixels. Flexible size of graphics files.
- INCLUDE function to call other text files from memory.
- Multi-WINDOW function allowing for different parts (windows) with different display modes. For example, freeze parts of the display while moving other parts.
- 30 schedule tasks with 3 priorities enable periodic tasks by week, month or year.
- User friendly interface and programming via infrared remote control.
- RS232 or RS422 interface. Modem is supported for long distance communication. Up to 255 signs in one network. Baud rates: 1200, 2400, 4800, 9600, 14400, 19200, 28800 and 57600.
- Duplex function allowing for reading stored data from the sign by PC and copying data from one sign to another
- Password security protects the sign from unauthorized access
- Automatic power ON / OFF schedule
- Memory Backup feature make the data storage more reliable


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## 1.2 Technical Specification

Table1 list the technical specification of our multi-line moving sign.

Table1 Technical Specification

| Item | Technical Parameters |
|---|---|
| Display Element | φ 5mm(default), φ 3.75mm or φ 3.0mm LED dot matrixes or LED lamps for indoor use; φ 5 or φ 8 for window brightness. |
| Display Color | 1. Monochrome: Red, Yellow Green, Amber, Blue, Pure Green, or White etc.<br>2. RG Multi-color: Red, Green, and Amber, mix color, etc. Total 16 color combinations |
| Average LED lifetime | Over 100,000 hours |
| PC Communication | RS232, RS422, Email, Modem, GSM Modem or Ethernet network. |
| Communication Distance | Max.15meters for RS232, 1200meters for RS422 |
| Remote Control | IR remote, 62 keys |
| Viewing Angle | 160°(H/v) for indoor models, 90°/40° (H/v) for window brightness |
| Working Temperature | -10°C to +40°C |
| Working Humidity | 15%-95% RH |
| Power Input | 100/220VAC , 60Hz/50Hz |
| Memory Retention | One year |
| Housing Material | Black Powder Coated Aluminum |
| Optional Fittings | RS232-RS422 convertor, Modem, RF Modem, GSM Modem, Ethernet adapter |


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## 1.3 Function Information

This part is descriptive some basal information of operation for the system.

### 1.3.1 Power-on Initialization

Upon power up the system initialization is performed as follows:

(1) Install fonts from the font chip, reports NO FONTS CHIP on failure.

(2) At initial startup, clear the memory, load default settings and set the real time clock to 1 Jan 2000, 00:00:00.

(3) Close unsaved files when abnormal shutdown. Abnormal shutdown will occur when power fails or system halts during remote control programming or serial communication access.

(4) Check the system data integrity. Despite the memory being backed up by a battery, it may become corrupted in some unusual circumstances. If the auto recover mode is off, the system will report VERIFY ERROR, and prompt for clearing of the affected data. If the auto recover mode is on, the memory will be recovered from the flash automatically without any prompt.

(5) Initialize the modem to automatic answer mode if modem detected.

### 1.3.2 Sign ON/OFF Switching

Switch the sign between ON and OFF States by pressing [ON] key. Power up the sign, it will perform the initialization and restore the conditions saved before the last power down. If the sign was in OFF State before last power down, the sign will still keep in OFF State and screen will be cleared; only one dot in the top-right corner will flash slowly. If the sign was in ON State before last power down, the sign will still keep in ON State and it will begin running preprogrammed files.

**Which file will run first?**

a. A default file will run when no other task in the schedule meets the running condition. Default file can be set with the [RUN] key.

b. If enable auto running demo, the DEMO file will run if no default file has been set. Otherwise the screen is black.

c. Scheduled tasks of the highest priority will run when they meet the running condition.

The [ON] key can turns the sign ON or OFF. When the sign is at OFF, it consumes low idle power even if it is still connected to the power source.


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### 1.3.3 Setting Default File

Presses [RUN] key, input the file name or use [NEXT] and [PREV] to select a file. It is possible to input first few characters and then use [NEXT] and [PREV] to find the file in the listing. Next presses [ENT] finished setting.

Uses [DEL] or [←] key to delete a character and [ESC] key to cancel the procedure.

**NOTES:** After setting the default file, it may not run immediately. The scheduled tasks will run first. Disable or clear all scheduled tasks if you want to run the default file only.

### 1.3.4 Display Text

Press [ON] key to turn OFF the sign. Press key [T] [E] [S] [T] [1]. The sign will display red, green and yellow on the entire screen.

### 1.3.5 Main Menu

Main Menu allows for easy programming of message files, arranging schedule tasks, configuring the sign etc..

Press [PROG] key to call up the Main Menu. The sign will show the menu items as follows:

**PROGRAM TEXT**

Performs all text file operations: NEW, EDIT, RUN, DELETE, RENAME and COPY, view PROPERTY.

**PROGRAM GRAPHICS**

Performs all graphics file operations: NEW, EDIT, DELELTE, RENAME and COPY, view PROPERTY.

**PROGRAM SCHEDULE**

Performs all schedule operations: NEW, EDIT, DELETE and DISABLE/ENABLE.

**SETUP**

Performs system configurations: DATE AND TIME, SERIAL ADDRESS, BAUD RATE, PASSWORD, AUTO ON/OFF SOUND ON/OFF.

**OTHER**

Performs all other operations such as: CLEAR MEMORY, CLEAR SCHEDULE, CLEAR GRAPHICS, CLEAR TEXTS, MEMORY info, SEND MEMORY.


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Press key [NEXT] and [PREV] to select an item.

**Available hot keys:**

[ON] Turn OFF the sign

[PROG] Open text file (creates new text file if there's no existing file)

[GRA] Open graphics file (creates new graphics file if there's no existing file)

[RUN] Close the main menu and return to the running mode


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# 2. Function & Operation

This section includes five parts:

- Text program
- Graphics program
- Program schedule
- System setup
- Other functions

## 2.1 Text Program

PROGRAM TEXT when selected, will list text files in the second line of the screen. The first item of the file list will be "- NEW -", which allows creating a new file. Use [→] and [←] to select a previously programmed text file. The file list is sorted by name, so by pressing the first character key of the name the selection may be faster. To select the first item ("NEW"), press [SPA] key.

### 2.1.1 Creating New Text Files

The following table shows how to create a new text file.

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press [ENT] key, the first item of file list "NEW" will be selected. The sign will create a new text file. | |
| 3 | Press [A] for file name, then press [ENT] to start editing text file (for details, see chapter:2.1.3 EDIT TEXT FILE ) | |
| 4 | Press [RUN] key finish the text editing and return to the running mode. | |

### 2.1.2 Text File Commands

After selecting a text file from the file list press [ENT] key to display commands menu. Uses [→] or [←] key to select a command. Press [ENT] key to execute it.

*Command and its meanings:*

**EDIT** Edit current text file

**RUN** Set current text file as default and return to running mode

**DELETE** Delete current text file. The screen will prompt: "DELETE TEXT A, ARE YOU SURE (Y/N)?". Press "Y" to confirm, "N" to cancel.


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**RENAME** Rename current text file
**COPY** Make a copy of current text file
**PROPERTY** View current text file's property such as size and modify time

*Available hot keys:*

PROG Edit the text file
RUN Set the text file as default and return to running mode
DEL Delete the text file

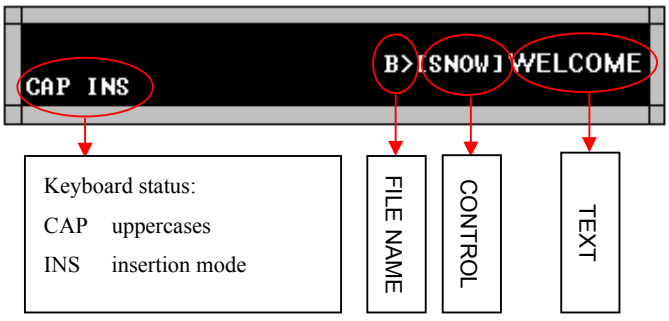
The following table shows how to edit an existing text file "B" (the text file "B" has been already created):

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press PROG key to enter the main menu. The first menu item PROGRAM TEXT will appear. | PROGRAM TEXT<br>- NEW - |
| 2 | Press B key to select the text file "B" | PROGRAM TEXT<br>TEXT B |
| 3 | Press ENT key to display the command menu. The first command EDIT will be shown. * | TEXT B<br>EDIT |
| 4 | Press ENT key to start editing the text file "B". | CAP INS B>[SNOW]WELCOME |
| 5 | Press RUN key to finish the text editing and return to the running mode. | |

* Pressing the PROG key will cause the system to go to edit text file "B" immediately after step 2.

## 2.1.3 Edit Text Files

### 2.1.3.1 Text Editor Interface




The contents of the text file will be displayed in a single line. The CURSOR is always located in the rightmost character of the screen. The file name will be displayed in the beginning of the text file and delimited by the character '>'. "CONTROLS" control display methods, fonts, colors and so on. They are often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delimited by '[' and ']'. The text is displayed in its actual font and color.

The current keyboard status is shown in the bottom-left corner of the screen.

**2.1.3.2 Text Editor Command Keys**

| | |
|---|---|
| [ON] | Close and save the file, and turn OFF the sign |
| [RUN] | Close and save the file and run it as default |
| [PROG] | Close and save the file and go to main menu |
| [CAP] | Toggle between uppercase and lowercase |
| [INS] | Toggle between insertion mode and overwriting mode |
| [ESC] | Hide / Show the keyboard status |
| [←] | Move cursor left |
| [→] | Move cursor right |
| [ALT][←] | Move cursor to the front page |
| [ALT][→] | Move cursor to the next page |
| [DEL] | Delete one text character or control character |
| [ALT][DEL] | Delete the current page |

**2.1.3.3 Changing Character Font**

Press [FONT] key to insert the text FONT control character. Uses [NEXT] or [PREV] key to select one of the 9 fonts.

The following table list available fonts:

| FONT | DESCRIPTION |
|---|---|
| [SS5] | SANS SERIF, 5 pixels height |
| [SS7] | SANS SERIF, 7 pixels height (Default) |
| [SF7] | SERIF, 7 pixels height |
| [SF10] | SERIF, 10 pixels height |
| [SS16] | SANS SERIF, 16 pixels height |
| [SF16] | SERIF, 16 pixels height |
| [TM16] | Times New Roman, 16 pixels height |
| [AR16] | Arial, 16 pixels height |
| [SMA] | Small Fonts, 8 pixels height |


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### 2.1.3.4 Changing Display Method

METHOD control is used to change the display methods.

Press [MET] key to insert the METHOD control character in the text. The sign has 41 display methods (including AUTO, SCROLL, ROTATE…etc). Press [NEXT] or [PREV] to select, or press [ALT][NEXT] or press [ALT][PREV] for faster selection.
The table below list available display methods:

| METHOD | DESCRIPTION |
|---|---|
| [AUTO] | Randomly selects one of the available display modes. (Default) |
| [IMMED] | Immediate display mode |
| [SLIDE] | Slide display modes (6 directions) |
| [COVER] | Cover display modes (6 directions) |
| [ROLL] | Roll display modes (6 directions) |
| [INSLID] | Interlace-slide display modes (4 kinds) |
| [INROLL] | Interlace-roll display modes (6 kinds) |
| [SHUTT] | Shutter display modes (4 kinds) |
| [JUMP] | Jump display mode |
| [SNOW] | Snow display mode |
| [RANDOM] | Random display mode |
| [SHOOT] | Shoot display mode |
| [EXPLODE] | Explode display mode |
| [TWINKLE] | Twinkle display mode |
| [FLASH] | Flash display mode |
| [PACMAN] | Pac-Man display mode |
| [SCROLL] | Scroll display mode, use to scroll a large continuous message |
| [ROTATE] | Rotate display mode, use to rotate a large continuous message |

### 2.1.3.5 Using Bold Wide and Blink Font

Press [ALT][0] key to insert the BOLD/WIDE/BLINK control character for the text. Use [NEXT] or [PREV] to select between BOLD, WIDE and BLINK. All text between two BOLD/WIDE/BLINK control characters will be displayed as bold/wide/blink font.

### 2.1.3.6 Changing Character Color

Press [COL] key to insert the text COLOR control character. Uses [NEXT] or [PREV] key to select one of the color combinations.
The following table list available combinations:


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| COLOR | DESCRIPTION |
|---|---|
| [ACL] | Auto color, circularly change color when load a new page |
| [RED] | Red (Default) |
| [GRN] | Green |
| [YEL] | Yellow |
| [RB1] | Rainbow color 1 |
| [RB2] | Rainbow color 2 |
| [RB3] | Rainbow color 3 |
| [RB4] | Rainbow color 4 |
| [RB5] | Rainbow color 5 |
| [MIX1] | Mixture color 1 |
| [MIX2] | Mixture color 2 |
| [MIX3] | Mixture color 3 |
| [MIX4] | Mixture color 4 |
| [MIX5] | Mixture color 5 |
| [MIX6] | Mixture color 6 |
| [MIX7] | Mixture color 7 |
| [MIX8] | Mixture color 8 |

### 2.1.3.7 Changing Message Moving Speed

Press SPE key to insert the SPEED control character. The sign supports 8 speeds. Use NEXT and PREV to select one of them. [SPEED1] is the lowest speed, and [SPEED8] is the fastest. Default speed is [SPEED5].

### 2.1.3.8 Changing Message Pause Period

Press PAU key to insert PAUSE control character for the text. Uses NEXT or PREV key to select one of the available pause periods.

| PAUSE | DESCRIPTION |
|---|---|
| [NO PAU] | No pause |
| [PAU 1S] | Pause 1 second |
| [PAU 2S] | Pause 2 seconds |
| [PAU 3S] | Pause 3 seconds |
| [PAU 5S] | Pause 5 seconds (Default) |
| [PAU 10S] | Pause 10 seconds |
| [PAU 30S] | Pause 30 seconds |
| [PAU 60S] | Pause 1 minute |


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### 2.1.3.9 Displaying Time and Date

Press [TIME] key while in the edit text file mode. The system will display the time insertion menu as in the following table:

| MENU ITEM | DESCRIPTION |
|---|---|
| INSERT TIME | Insert time, 4 formats: 23:59 (Default); 23:59:59; 12:59 AM; 12:59:59 AM |
| INSERT DATE | Insert date, 5 formats: 1 Jan 2000 (Default); Jan 1, 2000; 10/1/2000; 1/10/2000; 2000.1.10 |
| INSERT HOUR-24 | Insert hour in 24-hour mode |
| INSERT HOUR-12 | Insert hour in 12-hour mode |
| INSERT MINUTE | Insert minute |
| INSERT SECOND | Insert second |
| INSERT AM/PM | Insert AM/PM, 4 formats: e.g. AM (Default); A; am; a |
| INSERT WEEK | Insert day of week, 4 formats: e.g. Mon (Default); Monday; MON; MONDAY |
| INSERT DAY | Insert day of month |
| INSERT MONTH | Insert month, 5 formats: e.g. Jan (Default); January; 1; JAN; JANUARY |
| INSERT YEAR | Insert year, 2 formats: e.g. 2000; 00 |

Use [NEXT] or [PREV] key to select the time element, then press [ENT] key to insert it, or press [ESC] key to cancel.

After inserting the TIME control, uses [NEXT] or [PREV] key to change the time element format.

### 2.1.3.10 Displaying Graphics

Note: A graphics file must be created before it can be displayed. Please refer to Chapter 2.2 for details.

Press [GRA] key while in the editing mode. The system will prompt to input the graphics file name:

Input the file name or use [NEXT] or [PREV] keys to select a file. Then press [ENT] key to insert the selected graphics file, or press [ESC] key to cancel.

### 2.1.3.11 Starting New Line

In the text edit mode press [ENT] key to insert the NEWLINE control character (↵) in order to start a new line.

### 2.1.3.12 Starting New Page

In the text editing mode press [ALT][ENT] key to insert the NEWPAGE control character (---PAGE---) in order to start a new page.


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### 2.1.3.13 Multi-Window Function

This function allows to display a message in a selected screen area (window) and to align that message within the window by using WINDOW control functions.
Press [ALT][M] key while in the text edit mode. The screen will display a blinking box indicating the current window border. The coordinates for the top left corner, width and height of the window will be displayed in the center of the screen.

Use the direction keys: [◤] [▲] [◥] [◀] [▶] [◣] [▼] [◢] to move the left and the top border of the window. Hold the [ALT] key down while pressing one of the direction keys to move the right and the bottom border of the window. Keys [←] [→] or [NEXT] [PREV] in combination with [ALT] key may be used to modify the window box faster.

Presses [ENT] or [ESC] key to save the window size and position. The WINDOW control character will be automatically inserted in the text. Pressing [ALT][M] key will modify the window box again. Pressing [NEXT] and [PREV] key will select the text alignment mode of the window as listed below:

| WINDOW | TEXT ALIGNMENT |
|---|---|
| [▬L ▀T] | Left align and top align |
| [■C ▀T] | Center align and top align |
| [▬R ▀T] | Right align and top align |
| [▬L ■M] | Left align and middle align |
| [■C ■M] | Center align and middle align (Default) |
| [▬R ■M] | Right align and middle align |
| [▬L ▄B] | Left align and bottom align |
| [■C ▄B] | Center align and bottom align |
| [▬R ▄B] | Right align and bottom align |

### 2.1.3.14 Including Existing Text Files

Use this function to display a text file previously stored in the memory.
Press [ALT][N] key while in the text editing mode. The system will prompt for input of the filename of the text to be included:


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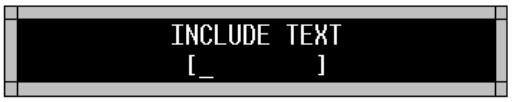


Input the file name or use [NEXT] or [PREV] to select one from the list. Then press [ENT] key to insert, or press [ESC] key to cancel.

INCLUDE control character will be displayed as [I: filename].

**NOTES:** The maximum depth of INCLUDE function is limited to 20. Cross-Including is not allowed.

### 2.1.3.15 Changing Line Spacing

Press [ALT][Y] key to insert the VSPACE control character that allows control the line spacing. The default line spacing is [VS 0]. In this setting the system will leave 1 pixel space between two adjacent lines wherever possible. When [VS 1-15] is selected, the line space will be set from 1 to15 pixels.

The VSPACE control character must be inserted in the beginning of a text line. Press [ALT][Y] key to select line spacing from [VS 0] to [VS 15].

### 2.1.3.16 Fast Cursor Positioning

Press [ALT][SPA] key while in the text editing mode. The system will display the "GO TO" menu. Use [←][→] or [NEXT][PREV] keys to select a menu item as listed below. Press [ENT] to move the cursor to the selected position.

| MENU ITEM | DESCRIPTION |
|---|---|
| GO TO<br>FILE BEGINNING | Move cursor to the file beginning |
| GO TO<br>END OF FILE | Move cursor to the end of file |
| GO TO<br>PREV CONTROL | Move cursor to the previous control character |
| GO TO<br>NEXT CONTROL | Move cursor to the next control character |

### 2.1.3.17 Deleting Large Number of Characters

Press [CLR] key while in the text editing mode. The system will display the "CLEAR" menu. Use [←][→] or [NEXT][PREV] keys to select a menu item as listed below. Press [ENT] to execute the selected instruction.


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| MENUITEM | DESCRIPTION |
|---|---|
| CLEAR ALL THIS FILE | Delete all characters in the file |
| CLEAR TO FILE BEGINNING | Delete all characters from the cursor position to the file beginning |
| CLEAR TO END OF FILE | Delete all characters from the cursor position to the file end |
| CLEAR TO PREV CONTROL | Delete characters from the cursor position to the previous control character (not including the control character). |
| CLEAR TO NEXT CONTROL | Delete characters from the cursor position to the next control character (not including the control character). |

### 2.1.3.18 Sound with Text

Press [BEEP] key while in the text editing mode to insert the SOUND control character. Use [NEXT] and [PREV] to select one of the 3 beep sounds: [BEEP1], [BEEP2] or [BEEP3]. The selected sound will be integrated with the edited text.

### 2.1.3.19 Inserting International Character

While in the text editing mode, first input one of the characters from the left column as in the table below, then press [NEXT] or [PREV] key to select an international character. For example: to input the character '€', the character '$' must be input first, then press [NEXT] key six times or press [PREV] key once.

**Remark: Appendix D list the international character.**

### 2.1.3.20 Displaying Temperature

Press [CPW] key to insert the TEMPERATURE control character to display temperature in the text file. Three formats temperature are available: Centigrade (°C), Fahrenheit (°F) and Kelvin (K), use [NEXT] or [PREV] to select them.

**NOTES:** This feature is avalable only for the sign that has installed temperature sensor.

### 2.1.3.21 Create a Decounter or Incounter

We often use a decounter to wait for an important moment such as Year 2K, World Cup 2002, etc.

We often use an incounter to count the safty running days, etc.

You can create a decounter or incounter like this:

Press [ALT][TIME] when editing text file, a menu will appear:

| | |
|---|---|
| **ADD DECOUNTER IN DAYS** | the result number is days to the given time |
| **ADD DECOUNTER IN HOURS** | the result number is hours to the given time |
| **ADD DECOUNTER IN MINUTES** | the result number is minutes to the given time |
| **ADD DECOUNTER IN SECONDS** | the result number is seconds to the given time |
| **ADD INCOUNTER IN DAYS** | the result number is days from the given time |
| **ADD INCOUNTER IN HOURS** | the result number is hours from the given time |
| **ADD INCOUNTER IN MINUTES** | the result number is minutes from the given time |
| **ADD INCOUNTER IN SECONDS** | the result number is seconds from the given time |


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Choose the item you need, then press [ENT] to continue, the screen will display:

Set the time that will be count down to or count up from and press [ENT], a decounter or incounter now has been created.

The decounter or incounnter add in text will display in a number from 0 to 65535. Larger number will display as '------'. The decounter will stop at 0 when the given time passed, and the incounter will display 0 even the time has not started.

## 2.2 Graphics Program

Graphics programming is similar to that of text programming.

### 2.2.1 Creating New Graphics Files

Follow the table below to create a new graphics file. Example filename: "A":

| STEP | PROCEDURE | DISLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press [NEXT] key to select the menu item "PROGRAM GRAPHICS". | |
| 3 | Press [ENT] key, the first item of file list "NEW " will be created as a new graphics file. | |
| 4 | Press [A] for file name, then press [ENT] to start editing. (For details, see chapter 3.3 EDIT THE TEXT FILE ) | |
| 5 | Press [RUN] key to finish the graphics editing and return to the running mode. | |

### 2.2.2 Graphics File Commands

After selecting a graphics file from the file list, press [ENT] key to display the command menu. Uses [→] or [←] key to select a command. Press [ENT] key to execute it.


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*Command and its meanings:*

**EDIT** Edit current graphics file

**DELETE** Delete current graphics file. The screen will prompt "DELETE GRAPH A, ARE YOU SURE (Y/N)?", press "Y" to confirm, "N" to cancel.

**RENAME** Rename current graphics file

**COPY** Make a copy of current graphics file

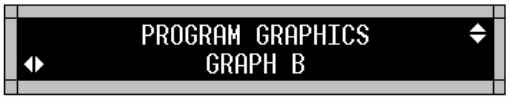
**PROPERTY** View current graphics file's property such as size and modification time.

*Available hot keys:*

PROG Edit the graphics file

DEL Delete the graphics file

The following table shows how to edit existing graphics file "B" (created previously):

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press PROG key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press NEXT key to select the menu item PROGRAM GRAPHICS. | |
| 3 | Press B key to select graphics file "B". |  |
| 4 | Press ENT key to display the command menu. The first command EDIT is shown. | |
| 5 | Press ENT key to start editing graphics file "B". | |
| 6 | Press RUN key to finish graphics editing and return to the running mode. | |

* Press PROG key to go to edit graphics file "B" immediately after step 3.

## 2.2.3 Edit Graphics File

### 2.2.3.1 Graphics Editor Command Keys

ON Close and save the file and turn OFF the sign

RUN Close and save the file and return to running mode

PROG Close and save the file and go to main menu

◤ Move cursor left and up

▲ Move cursor up

◥ Move cursor right and up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| | |
|---|---|
| ◄ | Move cursor left |
| ► | Move cursor right |
| ◣ | Move cursor left and down |
| ▼ | Move cursor down |
| ◢ | Move cursor right and down |
| • | Toggle paint mode |
| NEXT | Select pen color |
| PREV | Select pen color |
| SPA | Toggle one point drawing |

**2.2.3.2 Changing Graphics Size**

In graphics editing mode, press ENT or ESC key to changes graphics size.

Press key → or ← to select "HEIGHT" or "WIDTH" for changing the size. Press key NEXT or PREV to modify the value or ALT NEXT or ALT PREV to modify fast. Finally press ENT or ESC to complete.

It is also possible to adjust the graphics size by using the combined keys: ALT key plus one of the cursor-moving keys ◤ ▲ ◥ ◄ ► ◣ ▼ ◢.

**2.2.3.3 Draw and Erase**

Press • key to toggle the paint mode on/off. Use NEXT or PREV key to select color, move the cursor, then you can draw a line, which follow the track of cursor. To erase the line move the cursor along the line once again (keep paint mode on, do not change cursor color). The line will be erased.

The SPA key is used to draw or erase one dot.

**2.2.3.4 Clearing Entire Graphics File**

In graphics editing mode, press CLR key to clear the entire graphic. The screen will prompt as shown below:

Press "Y" to confirm, "N" to cancel.


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## 2.3 Program Schedule

PROGRAM SCHEDULE is the third item in the main menu. If no task exists in the schedule, the second line will display "- NEW -" prompting to create a new task. If there are some has programmed tasks already, use [→] and [←] key to select them.

### 2.3.1 Adding New Task To Schedule

The following table shows how to create a new schedule task:

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press [NEXT] key twice to select the "PROGRAM SCHEDULE". | |
| 3 | Press [ENT] key to start adding new task. | |

The following 7 steps are needed to create a new schedule task:

**Step 1** Input the text file name that will be run in task:

Uses [NEXT] or [PREV] key to select one, then press [ENT] key to continue.

**Step 2** Set the START DATE of the task:

The date format must be D-M-Y (date-month-year). Uses [→] or [←] key to move the cursor, and press number keys from [0] to [9] to modify, then press [ENT] key to continue.

If the year is set to 0, the year will be ignored and the task will start each year. For example, if START DATE is set to 01-05-0000, the task will start on May 1st of each year.

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If both, the year and the month are set to 0, the task will start each month. For example: START DATE 01-00-0000 means the task will start on the first day of each month.

If all of the year, month and day are set to 0, the task will be run always. This is also the default setting of the system.

**Step 3** Set the END DATE of the task:

The date format must be D-M-Y (date-month-year). Use → or ← to move the cursor, and press number keys from 0 to 9 to modify, then press ENT key to continue.

If the year is set to 0, the year will be ignored and the task will end each year. For example, if END DATE is set to 31-10-0000, the task will end after 31 Oct of each year.

If both the year and the month are set to 0, the task will end each month. For example, END DATE 10-00-0000 means the task will end after the 10th each month.

If all of the year, month and day are set to 0, the task will never stop. This is also the system default setting.

**Step 4** Set the START TIME of the task:

The time format must be hh: mm (hour: minute). Uses → or ← key to move the cursor, and press number keys from 0 to 9 to modify, then press ENT key to continue. The default START TIME is 00:00.

**Step 5** Set the END TIME of the task:

The time format must be hh: mm (hour: minute). Uses → or ← key to


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move the cursor, and press number keys from [0] to [9] to modify, then press [ENT] key to continue. The default END TIME is 23:59.

**Stet 6** Set the running days of the week:

Uses [→] or [←] key to move the cursor, and press [NEXT] or [PREV] key to modify, then press [ENT] key to continue. The default setting is run from Monday to Sunday (run on each day of the week).

**Step 7** Set the priority of the task:

Uses [NEXT] or [PREV] key to modify, then press [ENT] key to finish adding new task. The three levels of priorities are: NORMAL, LOW and HIGH.

This procedure can be canceled by pressing [ESC] key at any time. The new task will be displayed on the task list immediately after these 7 steps (In the second line of the screen).

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## 2.3.2 Modifying Existing Schedule Task

The following table shows how to modify an existing schedule task:

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Pres [NEXT] key twice to select "PROGRAM SCHEDULE". | |
| 3 | Use [→] and [←] to choose the task to modify. | |
| 4 | Press [ENT] key start to modify the task. | |

✶ 7 steps are needed to modify the task, please refer to section **2.3.1 Adding New Task To Schedule**

## 2.3.3 Deleting Task From Schedule

The following table shows how to delete a schedule task.

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press [NEXT] key twice to select "PROGRAM SCHEDULE". | |
| 3 | Use [→] and [←] to select the task to delete. | |
| 4 | Press [DEL] key to delete the task. | |
| 5 | Press [Y] to confirm deletion. | |


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### 2.3.4 Enabling/Disabling Schedule Task

The following table shows how to enable or disable a schedule task:

| STEP | PROCEDURE | DISPLAY ON THE SIGN |
|---|---|---|
| 1 | Press [PROG] key to enter the main menu. The first menu item PROGRAM TEXT will appear. | |
| 2 | Press [NEXT] key twice to select "PROGRAM SCHEDULE". | |
| 3 | Use [→] and [←] to select the task to enable/disable. | |
| 4 | Press [SPA] key to disable the task. Symbol '∅' indicates that the task has been disabled. | |
| 5 | Press [SPA] key again to enable the task. Symbol '◷' indicates that the task has been enabled. | |
| 6 | Press [RUN] key then return to the running mode. | |

## 2.4 System Setup

When selected, the setup menu command will be displayed in the second line of the screen.

*The setup menu commands:*

| | |
|---|---|
| **DATE & TIME** | Set current date and time |
| **SERIAL ADDRESS** | Set serial address |
| **BAUD RATE** | Set baud rate |
| **PASSWORD** | Set password |
| **AUTO ON/OFF** | Set automatic power on/off |
| **SOUND OFF/ON** | Toggle off/on the sound function |
| **AUTO BACKUP ON/OFF** | Toggle on/off the automatic backup memory mode |
| **AUTO RECOVER ON/OFF** | Toggle on/off the automatic recover memory mode |
| **BATTERY ON/OFF** | Toggle on/off the battery backup function |
| **AUTO DEMO ON/OFF** | Toggle on/off the automatic running demo function |
| **MAKE STARTUP** | Make the graphic file name "STARTUP" as startup picture |
| **CLEAR STARTUP** | Clear the startup picture |

Press key [→] and [←] to select the setup menu item, then press key [ENT]


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to perform the selected function.

Clearing memory or deleting graphic file "STARTUP" will not affect the system setup.

### 2.4.1 Date & Time

Select DATE & TIME from SETUP to adjust the real time clock. The screen will display:

Press key [→] or [←] to move the cursor, press key [NEXT] and [PREV] to modify, then press key [ENT] or [ESC] to finish. The real time clock will be set to 01 Jan 2000, 00:00:00 when it runs for the first time.

### 2.4.2 Serial ID Address

The serial address is a number from 1 to 255 that is used to identify the sign in the network.

Select SERIAL ADDRESS from the SETUP to set the sign address. The screen will display:

Press number keys from [0] to [9] for the serial address, or press key [DEL] to delete one character. Press key [ENT] or [ESC] when done.

The default serial address is set to 1.

### 2.4.3 Baud Rate

Select BAUD RATE from the SETUP to set the baud rate of the serial communication. The screen will display:

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Press key [NEXT] and [PREV] key to changed. Then press key [ENT] or [ESC]to finished.

The default baud rate is 9600. Available baud rates are: 1200, 2400, 4800, 9600, 14400, 19200, 28800, and 57600.

### 2.4.4 Password

Select PASSWORD from the SETUP to set the password. The screen will display:

Enter the password and then press [ENT] key. The system will prompt to enter the password again:

Retype the password and press [ENT] key. Now the password has been changed, and password protection function will be enabled automatically. The password protection will be disabled when it is set to null. Password is needed when using [PROG] key to enter the main menu in password protection mode. Input the password and press [ENT] key.

**NOTES:** Remember or record the password! If the password gets lost, in order to regain access to the system, disconnect the sign and power supply, open the case and connect the SW2 on the main board to ground then power up the sign.

### 2.4.5 Auto Power ON/OFF

Select AUTO ON/OFF from SETUP to activate or deactivate automatic power ON feature. The default setting is: Manual ON/OFF.

Use key [→] or [←] to choose the desired setting, press key [NEXT] or [PREV] to toggle MANUAL/AUTO. Set the Start time for the AUTO mode (default is 00:00, in HH:MM format). Use key [→] and [←] to select between HH and MM. Use key [NEXT] and [PREV] to modify time, press key [ENT] to complete.

### 2.4.6 Sound ON/OF

Select SOUND ON/OFF from the SETUP to enable/disable the sound function. Default is ON.


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### 2.4.7 Backup ON/OF

Turn on/off the auto backup mode. Under auto backup mode, memory will be backup automatically when the memory content has been changed. Auto backup occur when the memory has been changed and the sign has been running for 10 minutes. Manually backup is necessary if the sign is often moved such as which install on a bus. Default is OFF.

### 2.4.8 Recover ON/OF

Turn on/off the auto recover mode. Under auto backup mode, memory will be recovered automatically when the memory is found damaged. Otherwise, you must press [Y] or [N] to confirm the clearing of the affected data. Auto recover mode is the best choice when the sign connect to PC. Default is ON.

### 2.4.9 Battery ON/OF

Turn on/off the battery backup function. When the battery backup is on, memory content can keep for about 3 months without power supply. If you make sure that you don't need to keep the memory content, for example, you use a PC software to control the display at real-time, you can disable this function. Default is ON.

### 2.4.10 Auto Demo ON/OF

Turn on/off the auto running demo function. When auto running demo function is on, the system will run the DEMO file automatically when no scheduled task is running and no default file is set. The DEMO file is use to demonstrate the high preferment features of this product. Default is ON

### 2.4.11 Make Startup

Make the graphic file name "STARTUP" as startup picture. User must prepare a graphic file name with "STARTUP" first. This picture will be displayed on the next time the power is on.

### 2.4.12 Clear Startup

Clear the startup picture. Graphic file "STARTUP" will not be deleted by this

function. Default startup screen will be displayed on the next time the power is on.

## 2.5 Other Functions

When selected, the OTHER commands will be displayed in the second line of the screen.


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**CLEAR MEMORY** Clear all memory
**CLEAR SCHEDULE** Clear the schedule
**CLEAR GRAPHICS** Clear all graphics files
**CLEAR TEXTS** Clear all text files
**MEMORY INFO** View memory information
**SEND MEMORY** Send out all memory contents through serial communication to other signs. If you execute this command, the memory contents of all signs in the same net will become identical
**BACKUP MEMORY** Backup the memory to the flash memory.
**RECOVER MEMORY** Recover the memory from the flash memory

**Note: To send memory contents to other signs, the baud rates of all signs must be the same.**

Press key [→] and [←] to select a command, and press key [ENT] to execute it.

## 2.5.1 Clear Memory

All text and graphics files will be deleted, and the schedule will be cleared. The setup will not be affected.

## 2.5.2 Clear Schedule

All tasks in the schedule will be deleted.

## 2.5.3 Clear Graphics Files

All graphics files will be deleted.

## 2.5.4 Clear Text Files

All text files will be deleted.

## 2.5.5 View Memory Information

The system will display the text memory information first:

Then the graphics memory information:

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### 2.5.6 Send Memory

The SEND MEMORY command can perform the following functions:

1□ Send out the “Clear Memory” command to other signs;
2□ Send out all graphics files to other signs;
3□ Send out all text files to other signs;
4□ Send out the schedule to other signs;
5□ Send out the “Set default Running File” command to other signs.

### 2.5.7 Backup Memory

You should often backup the memory to avoid unforeseen data lost. The memory is battery powered and can be kept for only three months without power. The shaking of the sign during transportation may also damage the memory data. You can setup the sign to automatic backup mode.

### 2.5.8 Recover Memory

The memory will be recovered automatically when it is damaged. You can recover the memory manually by this command too. You can setup the sign to automatic recover mode. Refer to Chapter 5 for auto recover mode.


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# 3. Installation

## 3.1 Overview

Because every installation site is unique, there is no standard method of mounting. As manufacture of LED display, we don't supply support structure, we can only provide recommending for the support structure design. It is customer's responsibility to ensure that the structure and mounting hardware are able of supporting the Screen, and according with local laws.

Support structure design depends on the mounting methods, screen size and its weight. The structure design is critical and should be done only by a qualified individual and organization.

**The following must be considered first before installation:**

- Design support structure and groundwork; calculate carefully the needed strength according to local codes; especially note the wind load and the issue of Seismic Zone.
- For the reason of heat dissipation, the waterproof of the back of LED module is IP45; consider if any added shield needed for more protection. If LED Screen is enclosed in an enclosure or casing, air-conditions are needed for cooling when the environment temperature reach 30 $^{o}$C.
- Keep enough space for maintains.
- Prepare for routing power lines and fiber connection. If it is used in outdoor, it is best to route 4 fiber cables. Two are used for data transmitting and the other two are saved for spares. It is doubtless to route power lines and fiber cables in two separate conduits.
- Grounding consideration, we recommend grounding resistance must be less than 10 ohms.
- The relations of the screen body size with the distance of installing. The screen body size and the viewing distance should have the suitable proportion relations. The ordinary circumstances viewing distance may take the screen body opposite angle line length 2~20 double, and the effect is better when the viewing distance is in 6~10 doubles.
- The angle of installing: When the screen body installs, should pay attention to the direction of LED element's light. When the screen body installs at highly, should make the screen body to maintain the certain inclination angle, that in order to causes the direction of shines direct to best viewing position.


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- When the screen body installed, we should pay attention to the influence of outside electromagnetic radiation to the displays.

## 3.2 Common mounting method

The shape and size of Multi-Line LED electronic message center are different; the use of them is diverse and the method of mounting is most changeful. There isn't a unification standard of the mounting. Following we introduced several commonly used method of mounting.

**1) Hang type**

Hang type include two types. One is hanging up at the ceiling or other truss (fig2.1a shows). The LED moving sign is hanging up at ceiling or truss by the bracket. Another is hanging on wall (fig2.1b shows). The LED moving sign is mounting on wall by the bracket.

**2) Swing type**

Swing type is an especial of hang type. This method is hanging moving sign at wall by a bracket too. But the bracket have a suspend arm for Swing. Fig2.4 shows.

**3) Desktop installation**

This method must design a pedestal to support the LED moving sign. And the LED moving sign is installed on the pedestal. Fig2.2 shows it.

**4) Movable structure**

This method is base on desktop installation. It is different form desktop installation there are some wheels on the pedestal. So it can move easily. Fig2.3 shows it.

**5) Insert type**

Insert type is a method that the moving sign is inserted in wall or other object. Fig2.5 shows it. This method is always using for looking more beautiful.

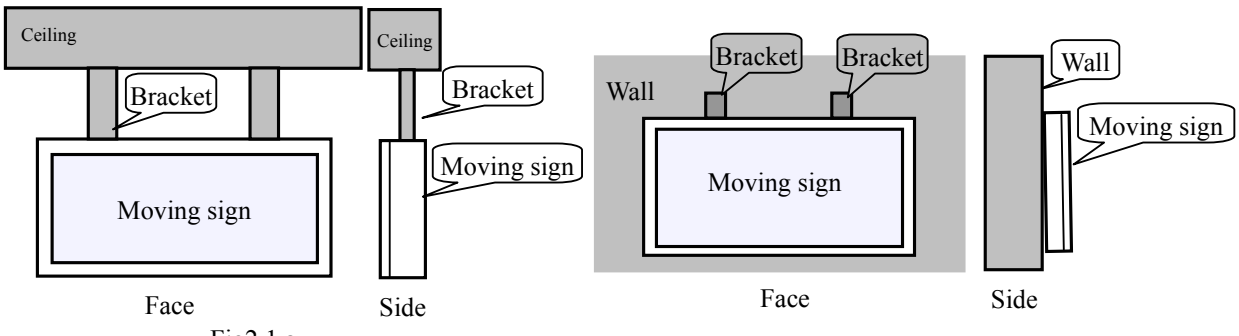


Fig2.1 a Fig2.1 b

Fig2.1 Hang type


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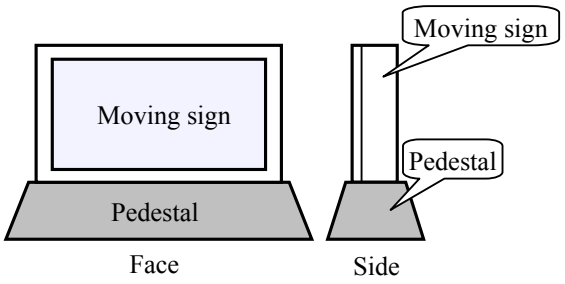


Fig 2.2 Desktop installation

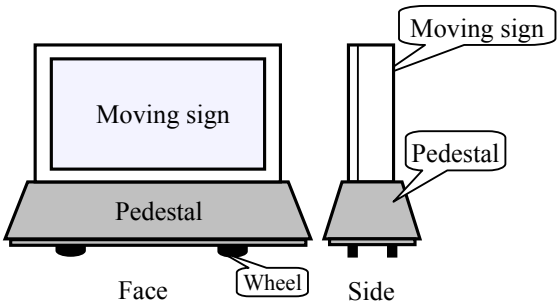


Fig 2.3 Movable structure

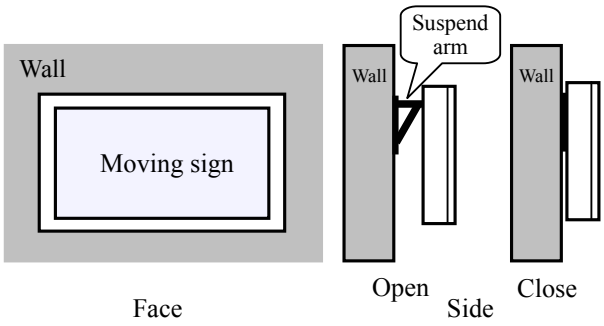


Fig 2.4 Swing type

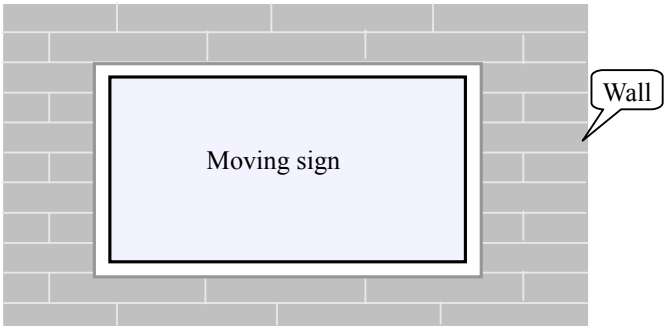


Fig 2.5 Insert type

Above mentioned method is several commonly used method of mounting. The hang type is the most simply. And its realization is easily. The swing type is based on the hang type, and more complex than hang type. This method can open or close according as your circs. If the place of installation is far form wall or ceiling and the moving sign is big, you can use the desktop installation. If moving sign needs move frequently should use movable structure. In somewhere such as hospital, company, public etc using Moving-Sign for sign. There usually adopt the insert type for beautiful.

Certainly, there are many other methods of mounting. We impossibility introduce all methods. User can choose an appropriate method of mounting according as your idiographic circs.

**Remark:** All these methods are must think the weight of moving sign at first. User must make sure the backstop can support the weight of the display while mounting it.


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# 4. System Connection

There are two parts work of connection in the system: power cable connection and signal/data cable connection for system.

Before connect you should read the data interface of this system.

## 4.1 Data Interface

Multi-line Moving Sign support PC control and TCP/IP network control. There should used RS232 cable or RS422 cable. In general, the connecter of cable is DB-9 interface. Following fig shows DB-9 connecter.

Female Male

Fig4.1 DB-9 connecter

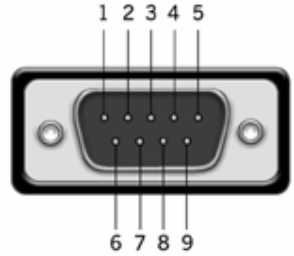


Fig4.2 Pin arrange


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## 4.2 Power connection

The power cables connection for outside are very simply. There need have electrical outlet (a Plug AC female) near the moving sign installed. User only need insert the plug male on the plug AC female. The plug male is connected with LED moving sign by a power cable from the power input port on cabinet. The plug AC female is form power source. Following fig shows the power cable connection.

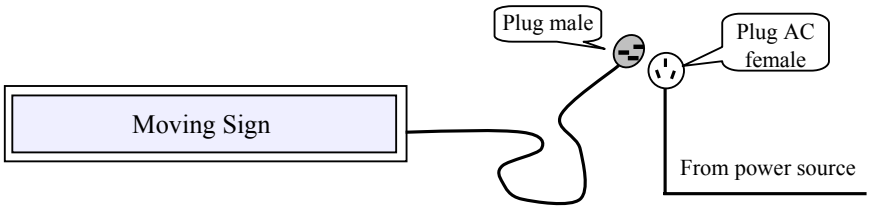


Fig4.3 Power connection


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## 4.3 Communication connection

The Multi-Line LED electronic message center can connect with PC by RS232, and can up to 128 units made a network via RS422 communication. Besides, it can use modem communication. And it support control by TCP/IP network (LAN) too. Following content is introduced these communication modes:

- RS232 communication
- RS422 communication
- Modem communication
- RF Modem communication
- GSM Modem communication
- Optical Modem communication
- TCP/IP network communication

### 4.3.1 RS232 Communication

RS232 communication mode is the default mode of the system.

Fig4.4 shows the Multi-Line LED electronic message center connect with PC by RS232 data interface, and fig4.5 shows the Circuit diagram connection of this communication mode.

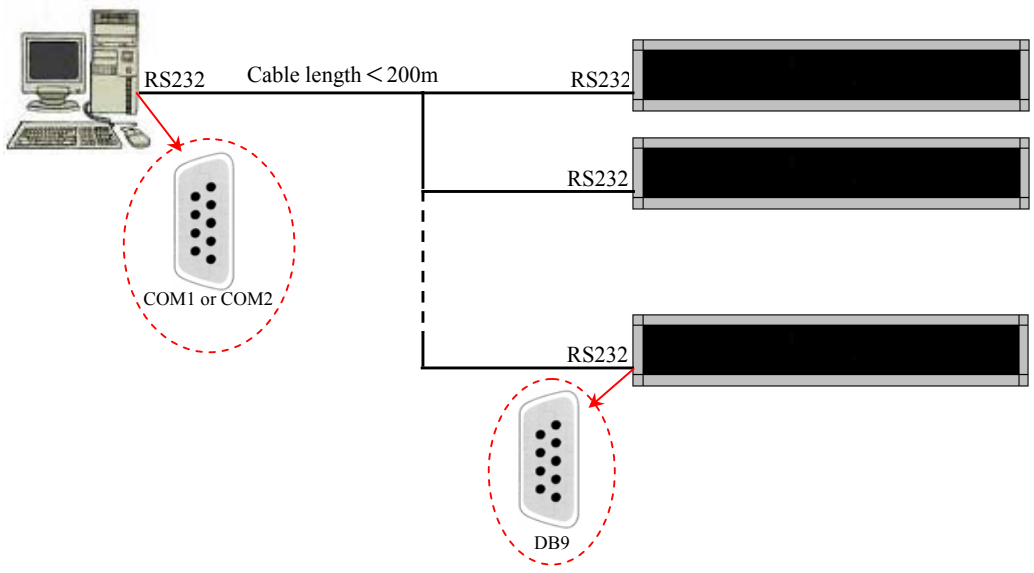


Fig4.4 RS232 Connection


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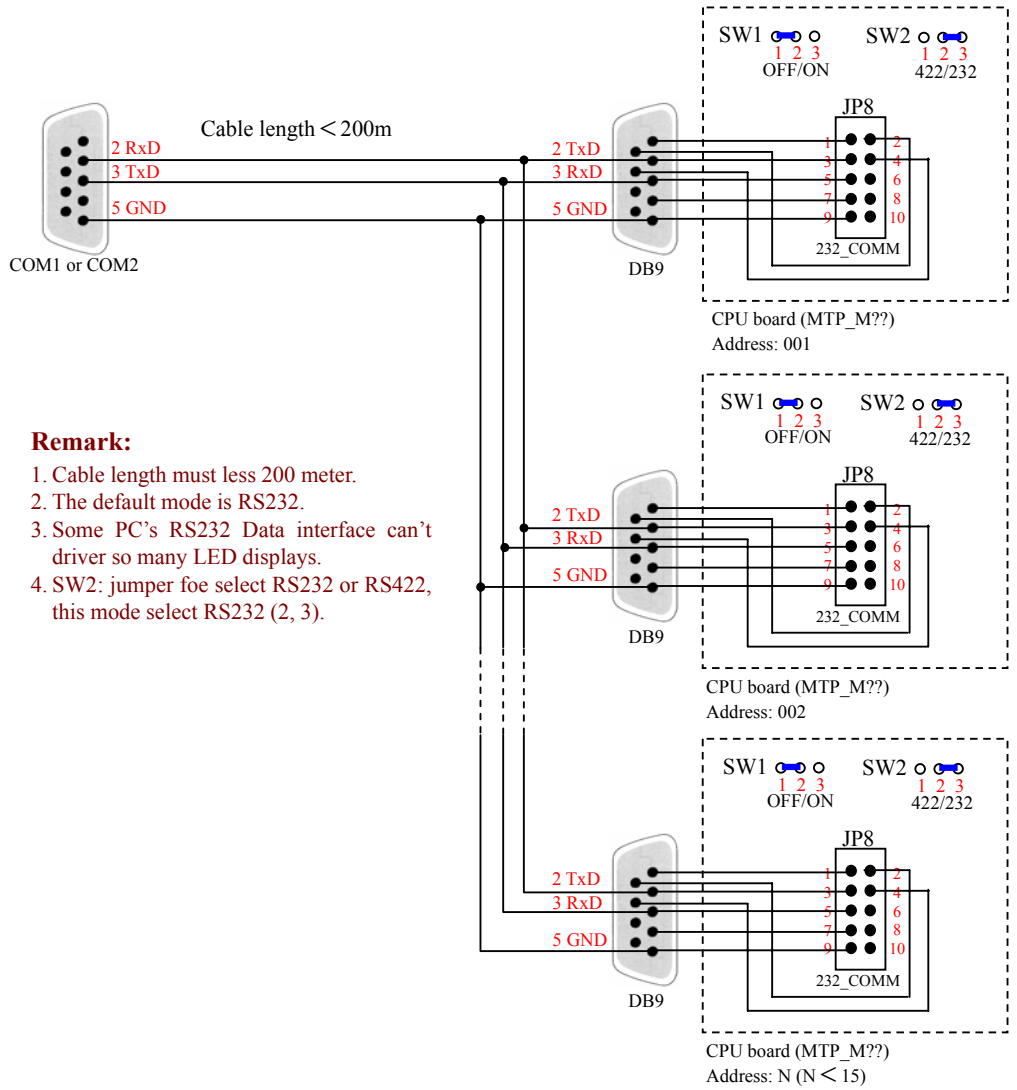


**Remark:**

1. Cable length must less 200 meter.
2. The default mode is RS232.
3. Some PC's RS232 Data interface can't driver so many LED displays.
4. SW2: jumper foe select RS232 or RS422, this mode select RS232 (2, 3).

Fig4.5 Circuit diagram of RS232 connection


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### 4.3.2 RS422 communication

Usually, PC didn't have the RS422 interface. When user want connect the LED display to control PC needs a RS232/RS422 adapter. This means is that RS422 communication mode must have a RS232/RS422 adapter.

Fig 4.6 shows the connection of RS422 communication, and fig4.7 shows the circuit diagram connection of this communication mode.

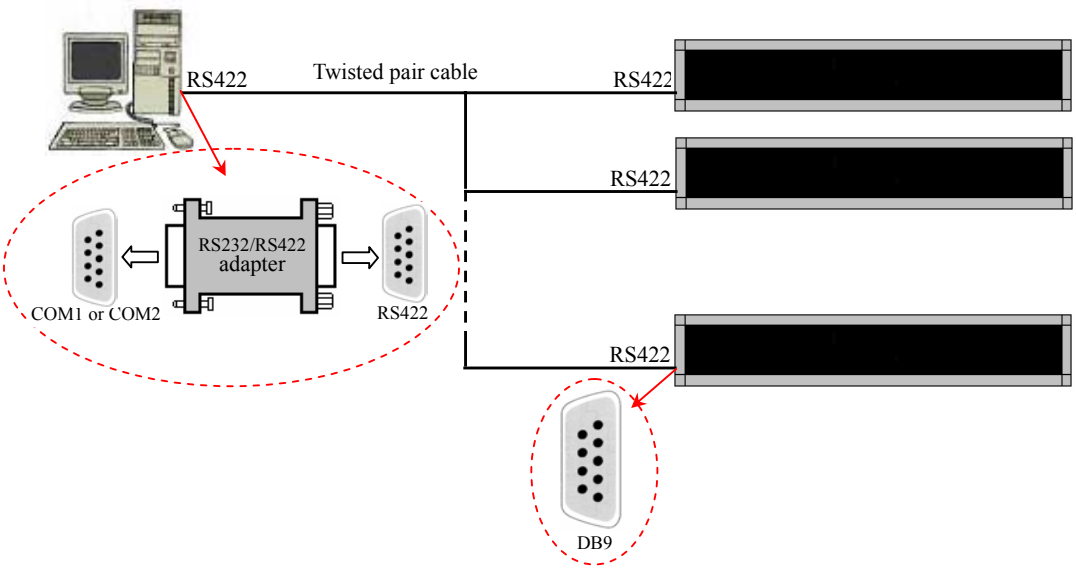


Fig4.6 RS422 Connection


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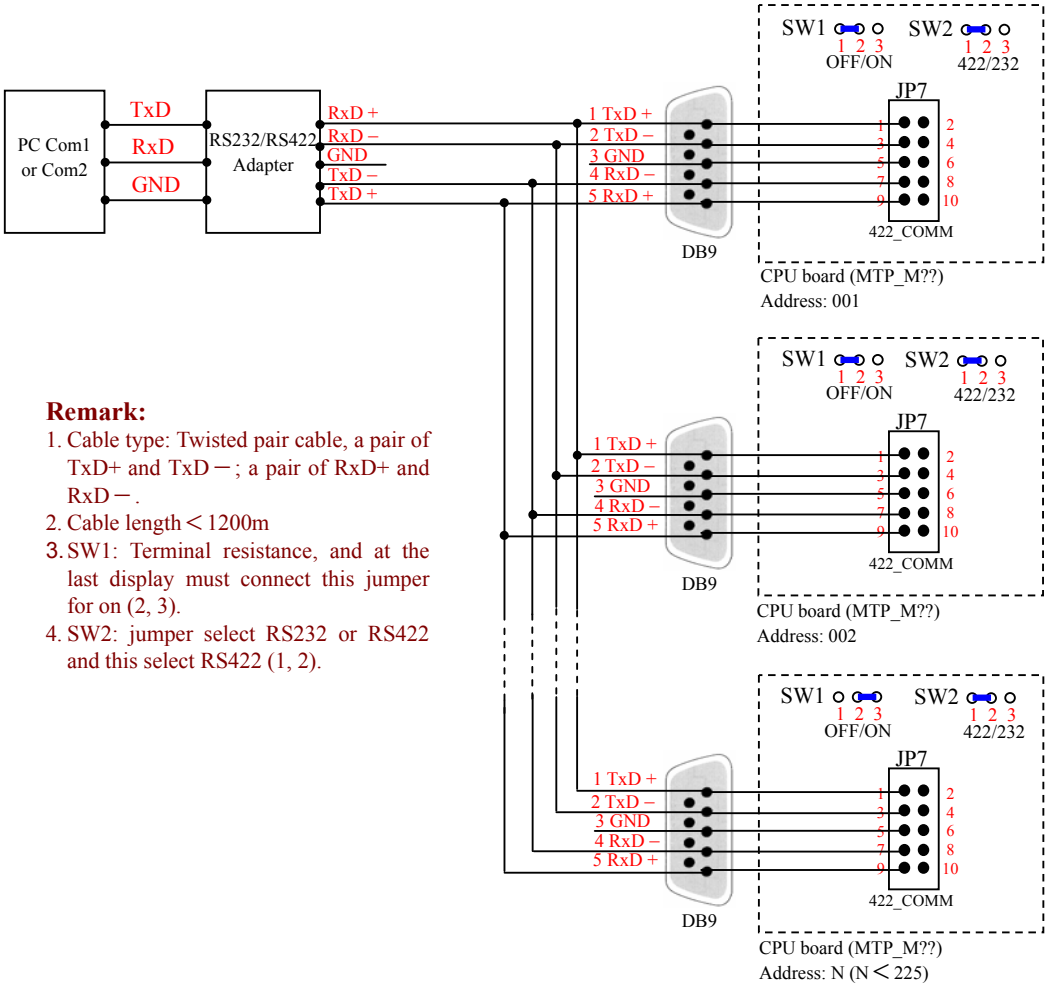


Fig4.7 Circuit diagram of RS422 connection


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### 4.3.3 Modem communication

This communication mode needs two modems, one connects with control computer, another one connects with LED display.

Following fig shows connection of modem communication mode.

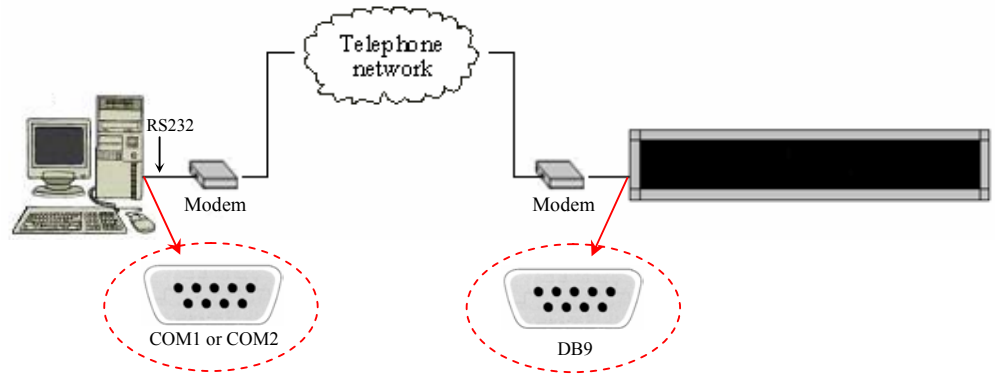


Fig4.8 Modem Connection


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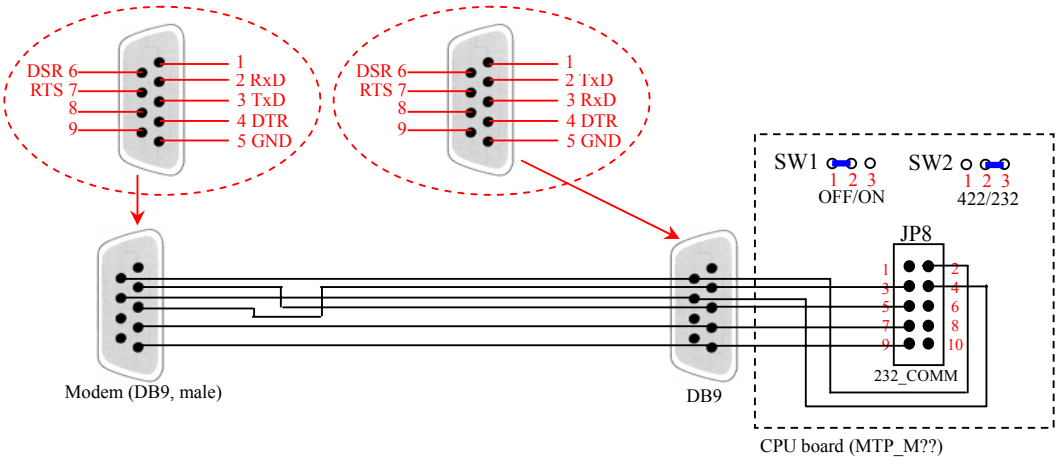
Following fig shows the circuit diagram of modem connection.




**OR**

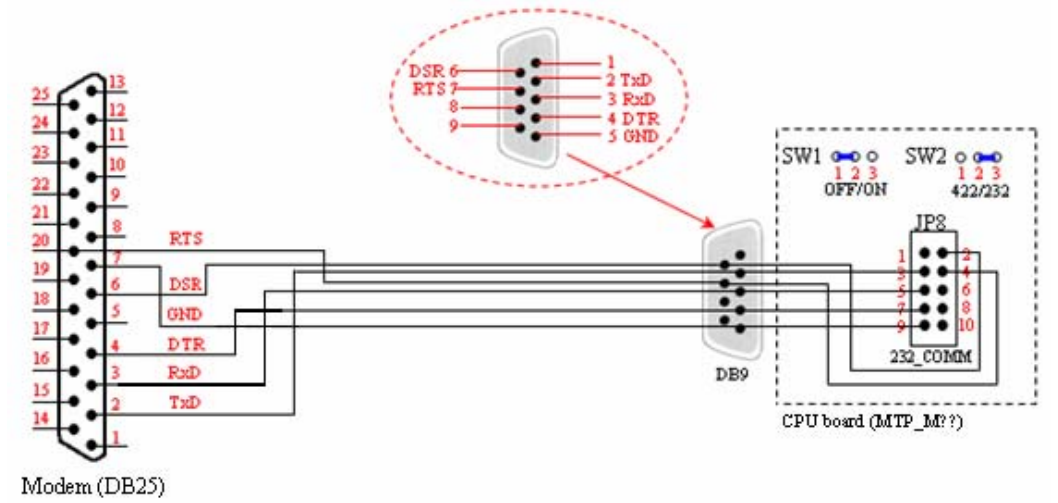



Fig4.9 Circuit diagram of modem connection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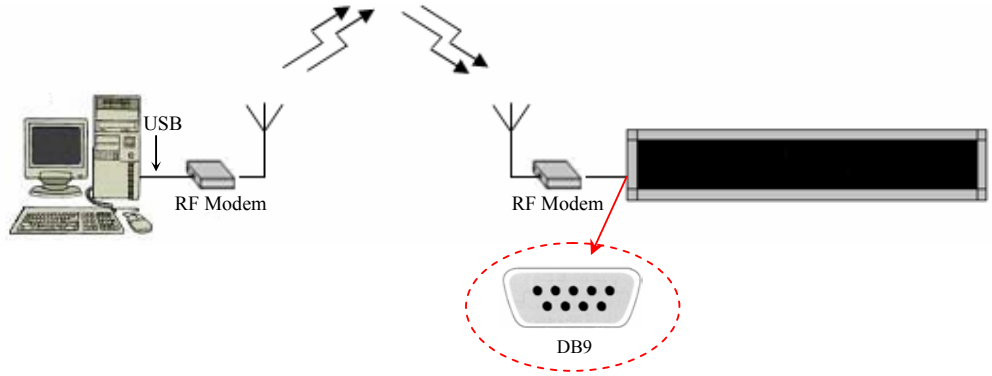
### 4.3.4 RF modem communication

This communication need two RF modem, one connect with control computer and another one connect with LED display.

RF Modem includes two types: one's port is USB, another one's port is DB9. In PC end, user can select using USB port type or DB9 port type. But in LED display end, we used the DB9 port type.




**OR**

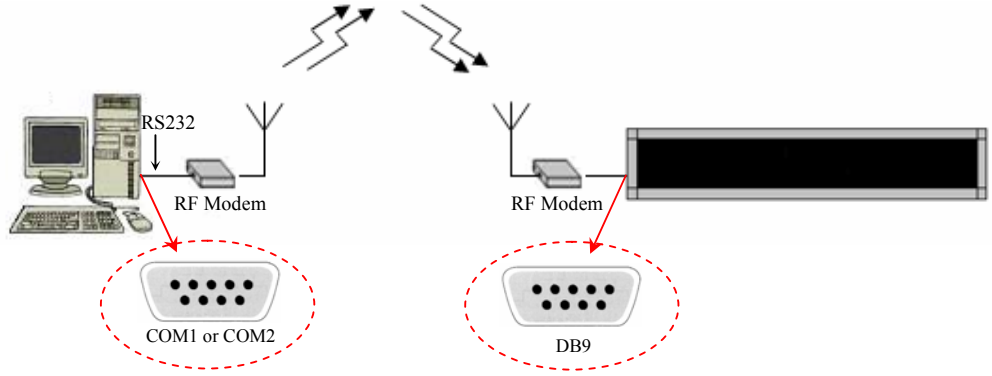



Fig4.10 RF modem connection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**PC end connection:**

If use USB port type RF Modem, user only need plug it to PC's USB port. Following fig shows the circuit diagram of DB9 port type RF Modem with PC.

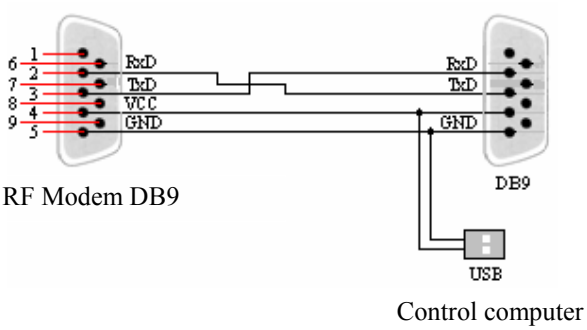


Fig4.11 Circuit diagram of RF modem connection

**LED display end connection:**

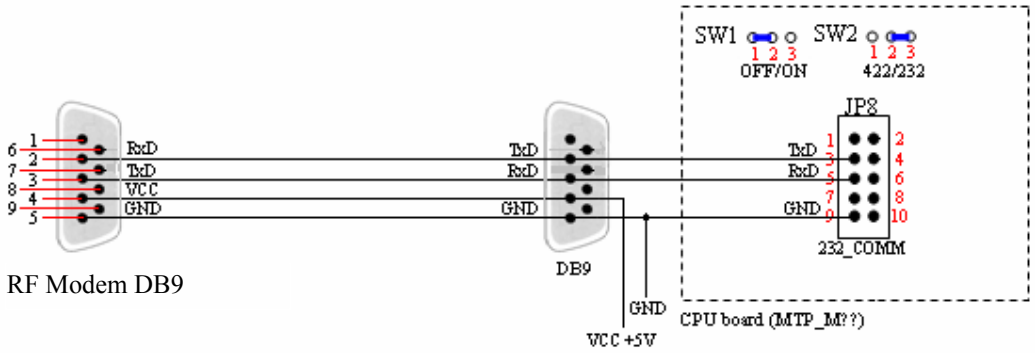


Fig4.12 Circuit diagram of RF modem connection


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### 4.3.5 GSM modem communication

This communication mode needs two GSM modem. One connects with control computer and another one connects with LED display.

Following fig shows connection of GSM modem communication mode.

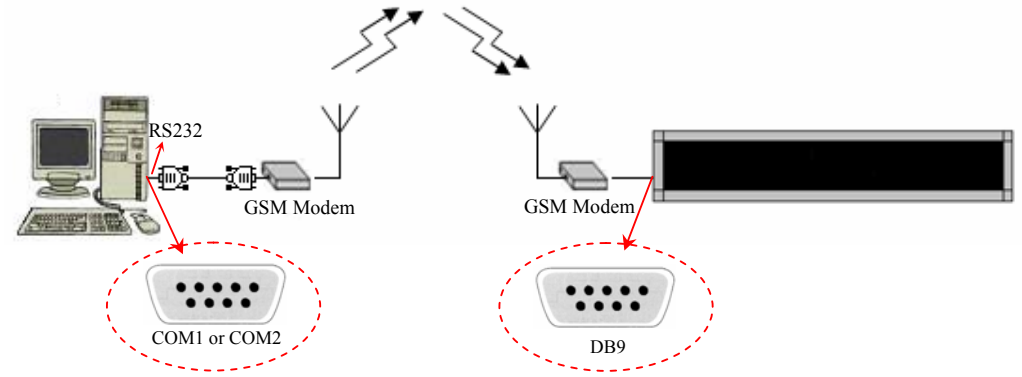


Fig4.13 GSM modem connection

Following fig shows circuit diagram of GSM modem connection.

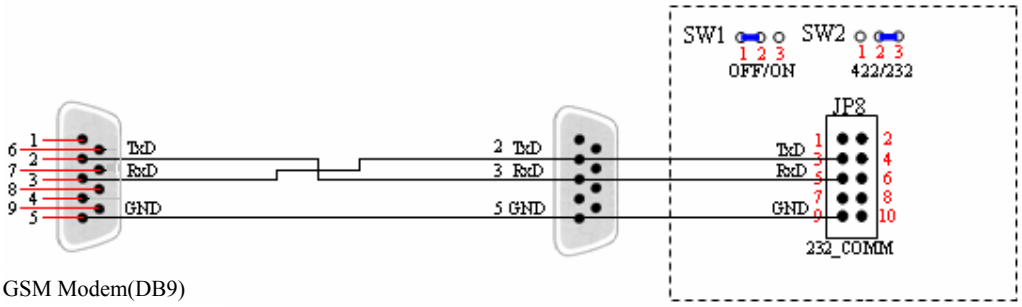


Fig4.14 Circuit diagram of GSM modem connection


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### 4.3.6 Optical modem communication

This communication mode needs two optical modems. One connects with PC, and another one connects with LED display.

Following fig shows connection of optical modem communication mode.

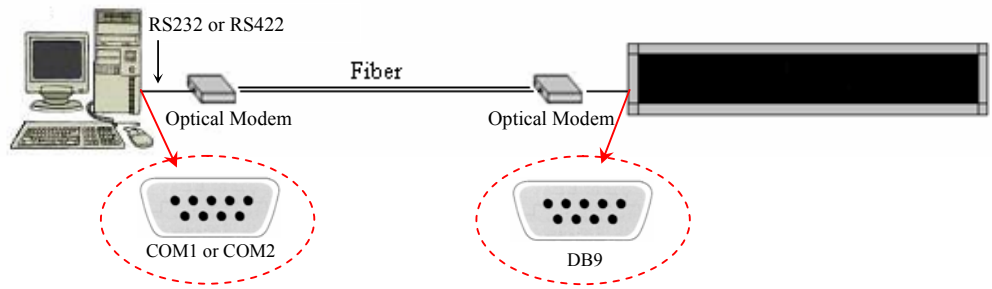


Fig4.15 Optical modem connection

**Remark:** If use RS422, need a RS232/RS422 adapter as same as a RS422 communication mode in PC end. There are Modelset switch on the modem. Use can select the RS232 or RS422 by the switch.

Following fig shows circuit diagram of optical modem connection.

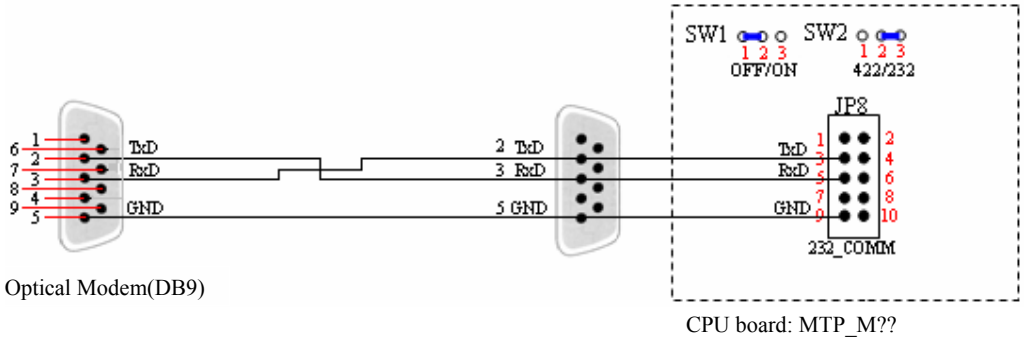


Fig4.16 Circuit diagram of optical modem connection


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### 4.3.7 USB communication

This communication mode needs a USB/RS232 adapter.

Following fig shows connection of USB communication mode.

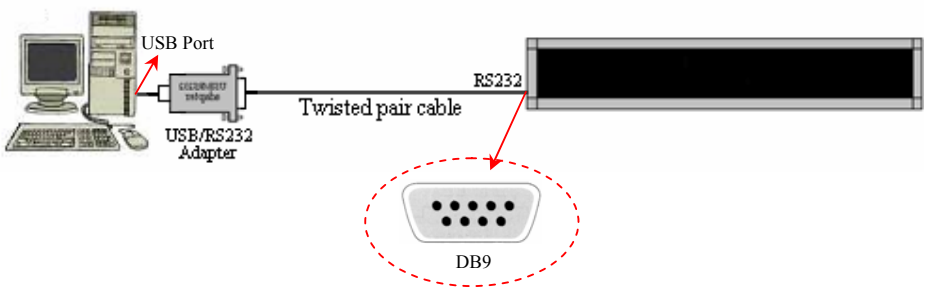


Fig4.17 USB connection

Following fig shows circuit diagram of USB connection.

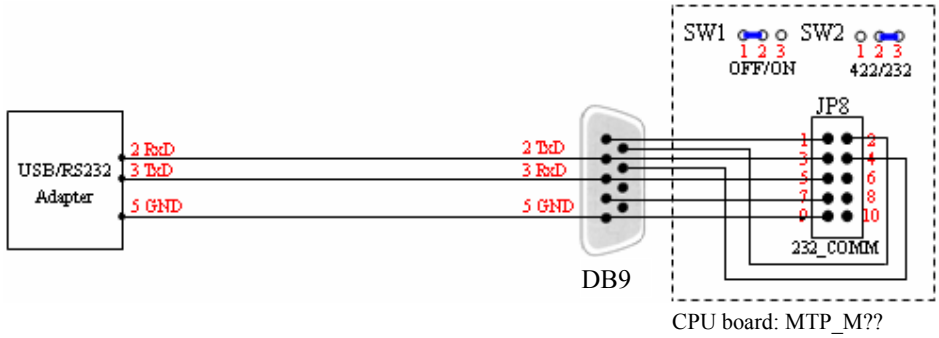


Fig4.18 Circuit diagram of USB connection

**Remark:** If there is no enough RS232 port of control compute while use other communication, user can use USB/RS232 adapter instead of RS232 port.


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### 4.3.8 TCP/IP network(LAN) communication

This communication mode needs a TCP/IP adapter for each LED display.

Following fig shows connection of TCP/IP network communication mode.

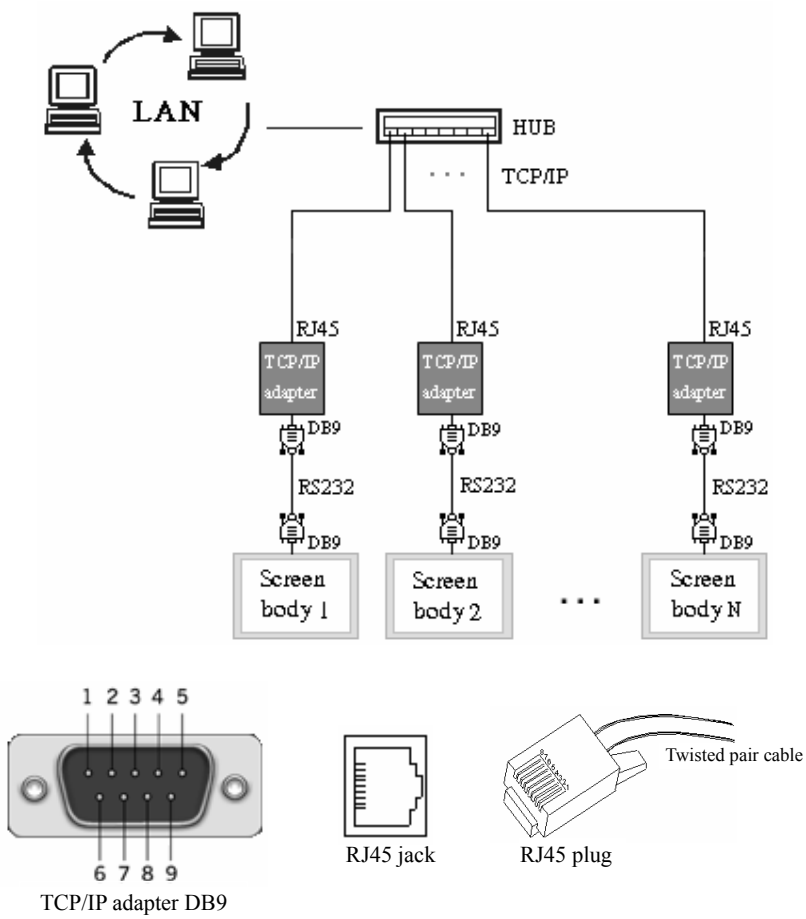


Fig4.19 TCP/IP network connection

**Remark:** The cable between HUB and TCP/IP adapter is the standard network cable(twisted-pair).


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Following fig shows circuit diagram of TCP/IP network connection.

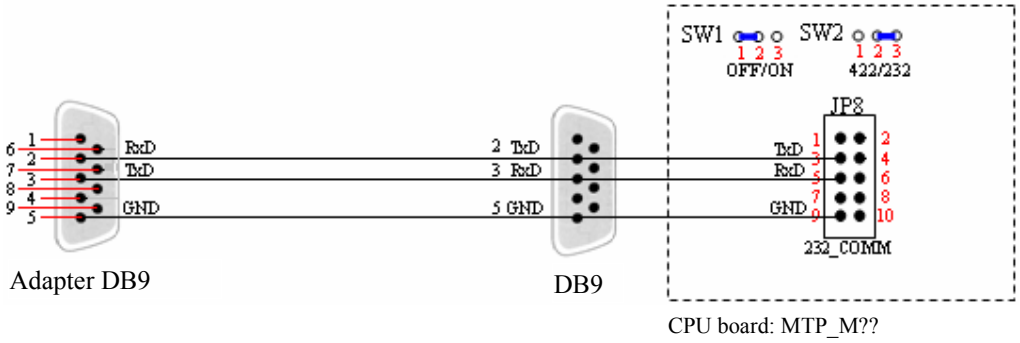


Fig4.20 Circuit diagram of TCP/IP network connection


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# 5. Installing Programs PC Setting

## 5.1 Installing the Management software

If you want send the message to your moving sign when the message sign has connected to computer correct. You need to install the message management software.

Insert the CD labeled “Multi-Line LED” into your CD disk drive. Double click the icon of your CD, then copy the file named “E2000TP” to your computer’s disk. This program is needn’t to installing. When you double click mouse left-key on the icon of the software on computer monitor desktop it will running. More information please refers to this management software’s user manual.

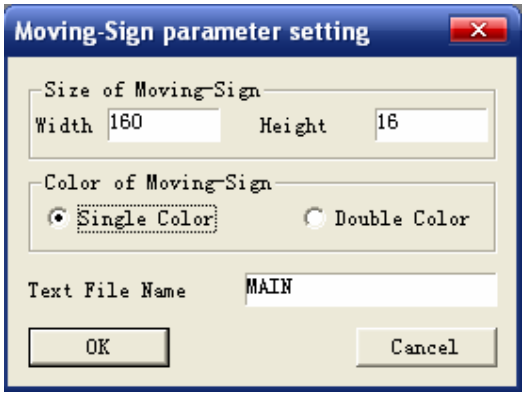
**Note:**

Please ensure your computer adapt to running this program. The program running environment is depicted in user manual of the management software. Please refer to it.

## 5.2 Setting your Software

Open the program by double clicking on the “E2000TP” icon on the desktop.

When running the program, click button or select menu ‘File > New’ to create a new document. A dialog will be displayed as following.




Set all parameter of the Sign, then click ‘OK’ button to confirm it. If user wants to know more information, please refer to the manual of this software.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# 6. Maintenance & Troubleshooting

**Important Notes:**

- Power must be turned off before any repair or maintenance work is done on the Display.
- Qualified service personnel must make any access to internal Display electronics.
- Study foregoing sections to understand configuration of the Display and the routing flow of power and signal.

## 6.1 Maintenance

A yearly inspection should be completed to maintain safe and dependable Display operation. This inspection should address the following issues:

- **Loose hardware** Verify fasteners, such as bolts and rivets, have not come loose. Fasteners should be checked and tightened or replaced as required.
- **Excessive Dust Buildup** Occasionally it may be necessary to vacuum the inside of the Display cabinet to remove dust/dirt buildup that may interface with airflow.
- **Water Intrusion** Water can enter the Display where weather seal has come loose or deteriorated or where fasteners has come loose allowing gaps in the panels or where moisture may be entering around hardware. Be sure to check around the lift eyes and bolts to ensure that water has not entered there. If so, replace hardware immediately to prevent more water from entering the Display. Also, check electronic components for possible corrosion.
- **Corrosion** Check the paint, and look for possible corrosion especially at footings, structure tie points and ground rods.
- **Fans Failure** Every fan installed on the backdoor of cabinet is controlled by a thermal switch and is turned on when the surface temperature of the cabinet reaches about 45$^{o}$C. Fans should be checked more often if the moving sign is located in a dusty environment. Fan blades and filters must be kept clean.


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## 6.2 Cleaning moving sign

Due to use the moving sign are exposed to all kinds of weather conditions. Sand, dust, smog and other dirt adhere on the moving sign and because of that the performance of the moving sign is reduced. So we recommend cleaning moving sign at regular intervals.

**Necessary tools**

- Damp cloth with a non aggressive detergent.
- Soft hand brush with long hair.
- Compressed air.

**Cleaning process**

1. Seal up the data and power sockets of the cabinet with a power and data cable. Make sure that all plug holder clamps are locked firmly.
2. Ensure that the unused output ports of cabinet are sealed with a dummy plug.
3. Use damp cloth with a non aggressive detergent to cleaning moving sign.
   **Warning:** Don't use industrial grease removers. Use only materials or chemicals that are inert, nonabrasive, noncorrosive and non-marking.
4. Brush down all dirt of the LED's and the shaders using a soft hand brush.
   **Warning:** Don't use a hard bristled brush.
5. Repeat from step 3 until the cabinet is clean.
6. Blow the surface dry with compressed air.


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## 6.3 Replacement

**Replacing LED modules**

1. Read follow the safety instruction in section 0.
2. Disconnect the power and data cables and all the cable strings from LED modules.
3. Loose these screws that fixed LED modules on grid of cabinet.
4. Pushing the LED modules forward out of the grid.
   **Warning:** Ensure you have a good grip on the LED module while releasing the module. We recommend there has one people hold the module in front at the same time while pushing.
5. Hand over the released LED module in front of the moving sign.
   **Note:** It's possible to pull back the LED module through the grid opening if required.
6. Snap in a new LED module from the front of the sign.
   **Warning:** Ensure to orient the LED module correctly while snapping in. The louvers on LED cluster modules must be upwards. And the weather-stripping on the back edge of the module must be intact and implanted in the slot of plastic module box
7. Use screws fixed new LED modules onto grid.
   **Warning:** The module should be firmly seated against the grid of cabinet.
8. Connect the new LED modules with cables.
   **Warning:** Ensure to fasten the captive lock of the plug.

**Replacing driver card**

Sometimes driver card is regarded as one part of LED module, it is fixed at rear of LED module by socket. To remove a driver card from module, disconnect cables and wires attached, then plug out the driver card from socket.
When installing a driver card to module, reverse the previous steps.

**Replacing control card and scan card**

There is no special handwork to replace these card but loose screws for fixing and disconnect the cables and wires attached, then you can take out it easily.
When installing a driver card to module, reverse the previous steps.


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## 6.4 Troubleshooting

There are some symptoms that may be encountered in the displays. This list does not include every possible symptom, but does represent common situations that may occur.

| Symptom/Condition | Possible Cause/Remedy |
|---|---|
| No display | • Check if the power socket located at the back of the sign is connected.<br>• Check if the AC power plug is plugged into the wall outlet.<br>• Check if the main power of the AC outlet is normal.<br>• Check if the auto on/auto off time setting is correct. |
| Not response to remote control | • Check if the batteries of the remote control still have enough energy. If user is not sure, please replace all the batteries.<br>• Check if the batteries of the remote control are placed at right polarity. Please follow the markings in the battery compartment.<br>• Check if there is anything between the remote and the sign blocking the remote signal. |
| No display but response to the remote control | • Check if the auto on/auto off time setting is correct.<br>• Check if the data in the files are valid.<br>• If you are not sure, you can enter the edit mode and press 'CLR' key of the remote control, select 'DEL ALL' to erase all data, this will reset the sign to display the default demo messages. |
| One or few rows of Display do not update information. | • Check internal RS232/RS422 cable.<br>• Replace CPU board. |

If the above procedures do not work, please contact your dealer.


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## 6.5 Return and Repair

Parts that are replaced by spare parts can be returned to us for repair. Please enclose your name, address, phone number, and a clear description of symptoms. When getting returned parts, we will inspect, test and repair it and send it back as soon as possible. The repairing work is free for a period of two years from the date of shipment. Each will pay the transportation charges. This means, user will pay charges for transporting goods to us and we will pay charges for return.

We retain the right to refuse part that has been damaged due to the acts of nature or causes other than normal wear and tear.

If you have any other question to ask or need any other service, feel free to contact with us or your agent.


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# 7. Appendix

## Appendix A: Additional programming tips

| Function Code | Definition | Possibilities/ Description | Control |
|---|---|---|---|
| METHOD | Display Option | Randomly selects one of the available display modes. (Default) | [AUTO] |
| | | Immediate display mode | [IMMED] |
| | | Slide display modes (6 directions) | [SLIDE] |
| | | Cover display modes (6 directions) | [COVER] |
| | | Roll display modes (6 directions) | [ROLL] |
| | | Interlace-slide display modes (4 kinds) | [INSLID] |
| | | Interlace-roll display modes (6 kinds) | [INROLL] |
| | | Shutter display modes (4 kinds) | [SHUTT] |
| | | Jump display mode | [JUMP] |
| | | Snow display mode | [SNOW] |
| | | Random display mode | [RANDOM] |
| | | Shoot display mode | [SHOOT] |
| | | Explode display mode | [EXPLODE] |
| | | Twinkle display mode | [TWINKLE] |
| | | Flash display mode | [FLASH] |
| | | Pac-Man display mode | [PACMAN] |
| | | Scroll display mode, use to scroll a large continuous message | [SCROLL] |
| | | Rotate display mode, use to rotate a large continuous message | [ROTATE] |
| COLOR | Alters the color of text | See Appendix B | |
| FONT | Changes the shape and size of characters | SANS SERIF, 5 pixels height | [SS5] |
| | | SANS SERIF, 7 pixels height (Default) | [SS7] |
| | | SERIF, 7 pixels height | [SF7] |
| | | SERIF, 10 pixels height | [SF10] |
| | | SANS SERIF, 16 pixels height | [SS16] |
| | | SERIF, 16 pixels height | [SF16] |
| | | Times New Roman, 16 pixels height | [TM16] |
| | | Arial, 16 pixels height | [AR16] |
| | | Small Fonts, 8 pixels height | [SMA] |
| SPEED | Changes the Speed of the display Scrolling | Speed 1 (Slowest) | [SPEED 1] |
| | | Speed 2 | [SPEED 2] |
| | | Speed 3 | [SPEED 3] |
| | | Speed 4 | [SPEED 4] |
| | | Speed 5 (default) | [SPEED 5] |
| | | Speed 6 | [SPEED 6] |
| | | Speed 7 | [SPEED 7] |
| | | Speed 8 (Fastest) | [SPEED 8] |
| PAUSE | Generates a pause within the programmed message | No pause | [NO PAU] |
| | | Pause 1 second | [PAU 1S] |
| | | Pause 2 seconds | [PAU 2S] |
| | | Pause 3 seconds | [PAU 3S] |
| | | Pause 5 seconds (Default) | [PAU 5S] |
| | | Pause 10 seconds | [PAU 10S] |
| | | Pause 30 seconds | [PAU 30S] |
| | | Pause 1 minute | [PAU 60S] |


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## Appendix B: Listing of color

| COLOR | DESCRIPTION |
|---|---|
| [ACL] | Auto color, circularly change color when load a new page |
| [RED] | Red (Default) |
| [GRN] | Green |
| [YEL] | Yellow |
| [RB1] | Rainbow color 1 |
| [RB2] | Rainbow color 2 |
| [RB3] | Rainbow color 3 |
| [RB4] | Rainbow color 4 |
| [RB5] | Rainbow color 5 |
| [MIX1] | Mixture color 1 |
| [MIX2] | Mixture color 2 |
| [MIX3] | Mixture color 3 |
| [MIX4] | Mixture color 4 |
| [MIX5] | Mixture color 5 |
| [MIX6] | Mixture color 6 |
| [MIX7] | Mixture color 7 |
| [MIX8] | Mixture color 8 |

## Appendix C: Listing of symbol characters

Note: The actual symbol appear in brackets ("[ ]") during the programming mode.

| | | | | |
|---|---|---|---|---|
| Sunny | Cloudy | Rainy | Clock | Phone |
| Glasses | Faucet | Rocket | Alien | Key |
| Sweater | Helicopter | Car | Tank | House |
| Teapot | Trees | Duck | Motorcycle | Bike |
| Crown | Hearts | Right Arrow | Left Arrow | Lower Left Arrow |
| Upper Left Arrow | Mug | Chair | Shoe | Martini Glass |


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## Appendix D: International characters

| General Character | International Characters |
|---|---|
| A | Ä Å Æ Á À Ã |
| C | Ç Ć Č |
| D | Đ |
| E | É Ê |
| I | Í |
| N | Ñ |
| O | Ö Õ |
| S | Š |
| U | Ü |
| Z | Ž |
| A | â ä à å æ á ª ã |
| C | ç ć č |
| D | đ |
| E | é ê ë è |
| I | ï î ì í |
| N | ñ |
| O | ô ö ò ó º õ |
| S | š |
| U | ü û ù ú |
| Y | ÿ |
| Z | ž |
| ? | ¿ |
| ! | ¡ |
| $ | ¢ £ ¥ Pts ƒ € |

## Appendix E: Remote keys description

1. ON Power On / Off. If there is no file in 01 to 99, it will run file 00.
   If there is file in 01 to 99, it will display the last saved file.
2. PROG Enter the Edit Program Mode. Select 01 to 99 to enter message.
   (File 00 for power on E1000 series demonstration, it can't be edited.)
   **Remark:** [Edit Program Mode] The pressed key will be shown in [Command] within the message.
   [In edit Program Mode] The pressed key will do some operation.
3. [Edit Program Mode] CPW Use for edit or reset password.
   (Use PREV and NEXT to select (a) to (d))
   (a) UNUSE PASS Turn off password security.
   (b) USE PASS Turn on password security.
   (c) RES PASS Reset password to factory default password ″000″
   (d) CHANGE PASS Change to new password.
4. [Edit Program Mode] MET To select the 25-display method.


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(Use PREV and NEXT to select (1) to (25) methods)

5. [In Edit Program Mode] PREV Select option backward.
6. [In Edit Program Mode] NEXT Select option forward.
7. [In Edit Program Mode] CAP Toggle between Capital letter and lower case character.
8. [Edit Program Mode] TIME to select time option.

   (Use PREV and NEXT to select the following options: )

   (a) SET TIME Set the current time.

   (b) SET DATE Set the current date.

   (c) ALARM Set alarm times and interval.

   e.g. C: 123M:001 means there will be 123 times of alarm signal at 1-minute interval.

   (d) HOURLY ALARM Set the hourly alarm On / Off.

   (e) 12- HOUR The time will be displayed in 12-hour format.

   (f) 24- HOUR The time will be displayed in 24-hour format.

   (g) ADD TIME Add time screen in display message.

   (h) ADD DATE Add date screen in display message.

   (i) OFF TIME Turn off the single line LED display at the programmed time.

   (j) ON TIME Turn on the single line LED display at the programmed time.

   (k) ADD TEMP Add temperature in display message. (Only available for models have temperature function installed.)
9. [Edit Program Mode] SPE to select the display speed of the message.

   (Use PREV and NEXT to select the different speed.)
10. [Edit Program Mode] FONT to select the font size of the display message.

    (Use PREV and NEXT to select the different font size.)
11. [Edit Program Mode] COL to select the color of the display message.

    (Use PREV and NEXT to select the different color of the display message.)
12. [Edit Program Mode] SYM to select 30 built-in symbols.

    (Use PREV and NEXT to select the different symbol.)
13. [In Edit Program Mode] CLR erase option.

    (Use PREV and NEXT to select the following options: )

    (a) DEL ALL Clear all messages.

    (b) DEL MSG Clear the current message.

    (c) DEL FILES?? Delete the specified file (01 to 99) or sequence file (S0 to S9)

    (d) DEL ON/OFF Delete the Auto ON/ OFF timer function.

    (e) DEL ALARM Delete the alarm function.
14. [Edit Program Mode] GRA select graphic option.

    (Use PREV and NEXT to select the following options: )


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(a) GET GRAPH Place the graphic in the message. Use PREV and NEXT to select GRAPH A to GRAPH H.

(b) MAKE GRAPH Create a new graphics in location GRAPH A to GRAPH H.

(c) EDIT GRAPH Edit GRAPH A to GRAPH P and store in one of the location of the location of GRAPH A to GRAPH H.

**Remark:** Please refer to 28. Cursor direction pointer to make and edit graphic.

15. [In Edit Program Mode] <= Moving the message and command to the right.
16. [In Edit Program Mode] => Moving the message and command to the left.

**Remark:** If you want to delete message or command in the edit program mode. Please use above key to move that message or command to the left-most position and press DEL. If you want to insert message or command in the edit program mode, Please use above keys to move that message or command to the left-most position and: (1) press INS to insert. (2) Type in your message or command key. It will insert automatically.

17. [In Edit Program Mode] ALT uses the alternative symbol in the keyboard.
18. [Edit Program Mode] PAU generates a pause within the programmed message. (Use PREV and NEXT to select PAUSE 1 to PAUSE 8.)
19. [Edit Program Mode] PHR select a programmed animation in the message. (Use PREV and NEXT to select ANIM 1 to ANIM 8.)
20. [Edit Program Mode] BEEP Select beep sound in the message. (Use PREV and NEXT to select BEEP 1 to BEEP 3.)
21. ENT accepts the selected option.
22. [In edit Program Mode] ESC return to the upper manual in the edit program mode.
23. [In edit Program Mode] INS refers to 15 and 16.
24. [In edit Program Mode] DEL refers to 15 and 16.
25. [Edit Program Mode] SPA inserts space in the message.
26. RUN (1)In edit program mode, press RUN to save and run the current message.
    (2)In display mode, press RUN and enter 01 to 99 to select other message for display.
27. [Edit Program Mode] S please refers to the topic: Programming a sequence file.
28. D E F Cursor direction pointer. J toggle cursor on /off.
    I J K
    N O P

**Remark:** The direction point only work in graphic edit mode.


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## *Appendix F: File Log*

| File No. | Descriptions |
|---|---|
| | |
| | |
| | |

# 8. Statement

User must read the manual before use our product.

Besides lists fitting along with the product disposition, the content of this manual contains doesn't represent pledge of the company.

This manual may contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this manual; these changes are incorporated in new editions of this manual.

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